COMPUTERWORLD

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The Premier 100

COMPUTERWORLD

Software stars rule

SAP, Oracle experts command top dollar, perks for their skills

By Julia King

Money can't buy you love. And money alone can't buy you top talent in client/server software from SAP AG or Oracle Corp., either.

Rather, recruiters say, information systems shops need lots of money plus plenty of perks in today's high-demand, short-supply market. Such perks include signing bonuses of $5,000 and more, luxury cars, fully paid housing expenses and, in some cases, a company commitment to support a foreign worker's immigration efforts.



Consultant Robert Smith *pulls in $195 an hour as an Oracle expert but also works 12- to 14-hour days*

"People with three-plus years' SAP experience can earn up to $150 an hour plus a car plus housing plus $30 to $50 per diem," said Hakan Pekkan, president of HR Link Group in Laguna Hills, Calif., which specializes in recruiting SAP experts.

"Sometimes it could be an auction. Candidates interview with multiple clients at one time and bid everyone against one another."

Software stars, *page 16*

CA to hike big iron fees

Some shops brace for hefty hits on licenses

By Thomas Hoffman

Mainframe software heavyweight Computer Associates International, Inc. will boost license fees for many of its mainframe products later this month, *Computerworld* has learned.

But the size of the increases and their impact on customers remain unclear. Sources close to CA said the rate hikes will fall in the 1% to 8% range and affect only a handful of products. But analysts insist that a wide variety of CA mainframe software shops will be hit with stiffer increases in their annual license fees — from 6% to as high as 25%.

The higher license fees will in turn pull up CA's maintenance fees, which are typically 12% to 16% of the base mainframe license fees.

CA officials last week declined to comment on the pricing changes.

Different drummer

While CA is boosting fees, officials at Boole & Babbage, Inc. and BMC Software, Inc. said their firms don't intend to follow CA's lead.

Early warning

One customer bracing for a price hike is Key Services Corp., the Cleveland-based services subsidiary of KeyCorp. It runs three data centers with a number of high-end IBM-compatible mainframes.

Robert L. Tucker, who until recently was executive vice president and manager of information services at the unit, said his CA sales representative told him in mid-September that the bank would face an uptick in its CA

CA, *page 159*

NetWare, Win 95 mix it up

By Laura DiDio

Users are finding that the initial integration of Novell, Inc.'s NetWare and Microsoft Corp.'s Windows 95 is a bit like going on a blind date: awkward at first but full of potential.

In interviews last week, information systems managers at several large corporations said they are encountering many of the typical problems associated with a major new release of an operating system.

They added that there are ways to work around most of the problems — although identifying the source of a glitch can be difficult.

For example, once users overcome their initial unfamiliarity with the foibles of the operating system, they discover fixes that let them support long file names and overcome irregularities with loading log-in scripts.

Rescue party delayed

Meanwhile, Novell may find it has a bigger fire to contain among those businesses that were depending on its 32-bit Client Requester for Windows 95 beta software — which the company had promised to release on Sept. 30 — to help them over the rough spots.

On-line forums exploded last week as more than 600 outraged users bemoaned the Provo, Utah-based firm's announcement that it will delay widespread delivery of the requester software until sometime next month. The software will let Windows 95 workstations access NetWare 4.x directory ser-

NetWare, Win 95, *page 14*

Graveyard shift

Late-night IS staff fight anonymity

By Joseph Maglitta



Around 3 o'clock, Joe Sheehan likes to suit up and go for a jog past the Boston Common. "It helps keep you awake," the 33-year-old senior operations specialist explains.

That's a good idea, because we're talking about 3 a.m., when the gentle hum of the data center can lull even the most alert on the graveyard shift at The New England, an insurance and investment firm with assets of $61 billion.

To get a firsthand feel for the pluses and cusses of nocturnal information systems, I recently joined workers on the overnight shift at the company, the nation's oldest mutual insurer.

To most of us, it sounds like job heaven: few phone calls, no electronic mail, no meetings and no traffic jams. Every day is casual day. And no nagging users always in your face.

But working the 7:30 p.m. to 8 a.m. shift is no day, er, night, at the beach, say the 18 workers who labor after dark at The New England. Anonymity, fatigue, social isolation and surprisingly heavy workloads can make for long, even lonely, hours.

Still, some wouldn't trade it for anything.

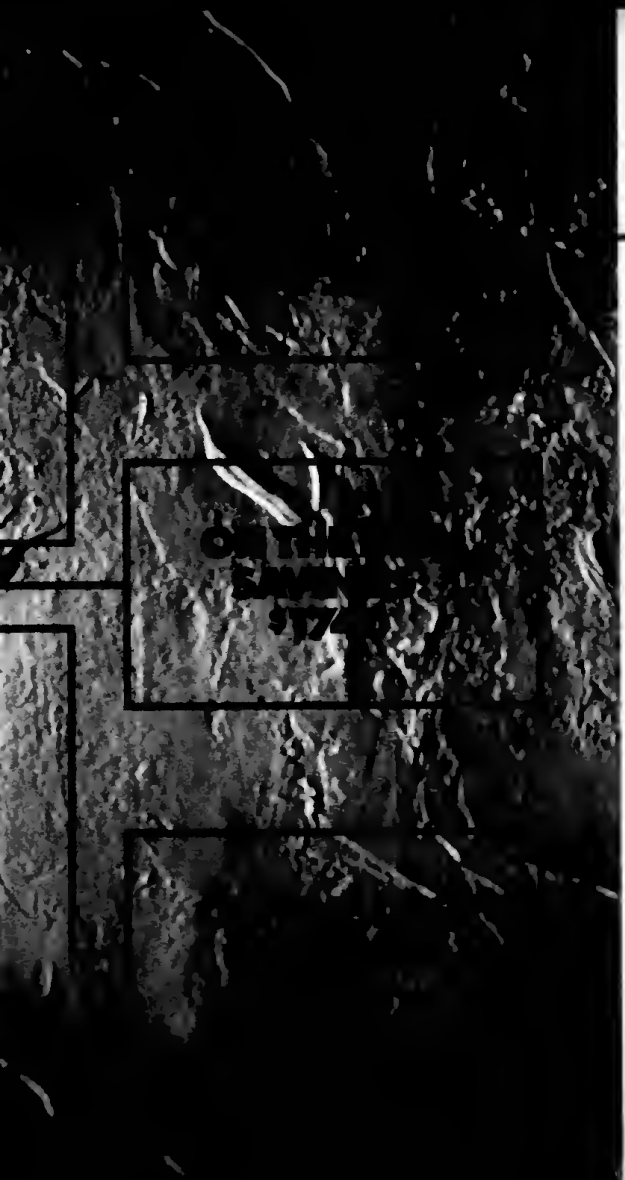
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Newspaper

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Inside Computerworld

Oct. 9, 1995

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Leading social critics, authors, economists and technological leaders gather in San Francisco to talk about **the future of technologies** *such as the Internet and the implications for society.*
Enterprise Networking, page 78



Lester Thurow



Alvin Toffler

Choice Cuts



IS teams must dispatch issues with lightning speed. Managers and consultants share **tricks and techniques** *for fast teams.*
Management, page 104

All enterprise-class **servers** *are fast. So IS purchasers need a* **new yardstick** *to evaluate vendors and products. Experts tell what to look for besides speed.*
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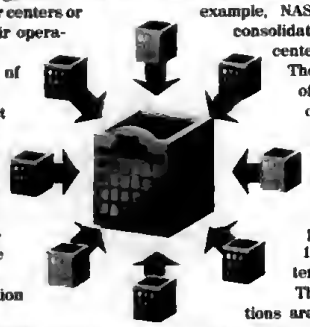
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Data centers feel White House pinch

By Gary H. Anthes
WASHINGTON

The White House last week directed all executive branch agencies to consolidate small and midsize data processing centers into more efficient larger centers or outsource their operations entirely.



The Office of Management and Budget said it expects the large centers to operate 30% to 50% more efficiently and save the government some $500 million a year.

The government doesn't keep a master list of its data centers, but a recent survey identified 205 centers employing 12,900 people and spending $2 billion a year. The number of centers could fall to between 40 and 60 under the White House plan, said John R. Ortego, director of the General Services Administration's Federal Systems Management Center.

A budget office bulletin, issued last week, offered guidelines for the two-year consolidation effort. It said each IBM mainframe center should have a minimum of 325 MIPS of processing power on the premises, and it set similar floors for other kinds of environments.

Some agencies will have to scramble to meet the two-year schedule, and considerable personnel dislocations could result. Ortego said it wasn't possible to say how many people would lose their jobs or be reassigned.

Ortego acknowledged the plan is getting a mixed reception among federal data center managers. "There are the people running large centers, and they see this as an opportunity to grow and modernize," he said. "But if you are running a small center, obviously this is a stressful situation. Even if you know it to be good government, it's still very painful."

Some agencies are already well down the consolidation path. For example, NASA is already consolidating eight data centers into one. The Department of Defense recently shrank its pool of data centers from 194 to 59 and plans to reduce that pool again to 16 megacenters.

The consolidations are based on an analysis that revealed large centers are much more efficient than small ones from a labor standpoint. For example, the centers averaging 36 MIPS in total mainframe processing power required almost one person per MIPS to run. However, centers averaging 767 MIPS could be run with just one-third of a full-time employee per MIPS.

But some observers said bigger is not always better. "There are some serious security risks to putting all your eggs in one basket," said Robert Dornan, a senior vice president at Federal Sources, Inc. in McLean, Va. "And as you consolidate, the end user loses control. The farther away the resource is, the harder it is for the user to solve his problem."

According to Ortego part of the consolidation plan is to modernize the large centers that remain. "We don't want those centers to become dumping grounds for old iron," he said. "And you need a very good physical plant because the government is risking more resources in fewer locations."

The numbers tell the story on data consolidation

Total MIPS	Number of centers	Average MIPS per machine	Yearly expenditures per MIPS	Full-time employees per MIPS
1-99	44	31	$127,500	.92
100-199	10	143	$129,800	.51
200-299	6	258	$100,000	.76
300-399	5	336	$87,600	.58
400+	7	767	$87,700	.33

Base: 74 federal centers with IBM mainframes and IBM compatibles

Source: Federal Systems Management Center, Falls Church, Va.

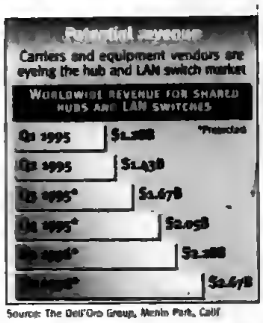
Alliances put focus on smaller-business LANs

By Bob Wallace

Major internetworking vendors and carriers are moving aggressively to forge alliances designed to make life easier for midsize and small businesses by providing packages that comprise switches and wide-area network links.

A flurry of announcements are expected in the coming months, analysts and vendors said. The alliances are designed to help users who don't have the staff or time to build and maintain wide-area LAN internetworks.

"It's primarily a staffing issue, where users can't be networking professionals and still focus on their core business," said Steve Taylor, president of Distributed Networking Associates, a Greensboro, N.C., consulting and education firm. "Shoe companies need to focus on selling shoes."



Source: The Dell'Oro Group, Menlo Park, Calif.

In some cases, users are driving the need for these alliances. But analysts contend that equipment vendors see this as a huge and largely untapped new market, while carriers view it as a way to sell more than just WAN pipes.

Center of gravity

Bill Horst, chief of the General Services Administration's communications branch in Philadelphia, said small firms would be most interested in these type of packages. However, network managers at big locations with small branch sites would be reluctant to relinquish control of networking at far-flung sites to a carrier, he added.

These alliances are akin to outsourcing, except that there is no user staff to transfer or eliminate. But going with a carrier to provide an integrated system means the user relies entirely on that company for installation, management, billing and ongoing performance monitoring.

And the alliances could include more than just boxes and WAN links.

"We're looking beyond products to revenue from service, support and warranties," said Edgar Masri, vice president and general manager of premises distribution at 3Com Corp.

"The same users that don't want to install and maintain these systems also don't want to manage them," said Mike Skuhisz, director of product marketing at Cabletron Systems, Inc. "The carrier could use our switches and our Spectrum network management system to manage them."

A senior AT&T Corp. executive said last week that AT&T is keenly interested in this type of arrangement.

"We'd be very interested in partnering with a market leader like Cisco and others," said Gary Hickox, vice president of applications and imaging services at AT&T.

"I think the carriers will have to first prove that going with them will be more cost-effective than going it alone," said Horst, who saw another shortcoming to this latest version of one-stop shopping. "If one carrier provides you everything, you'd lose some flexibility of being able to change carriers."

Today, carriers go only as far as offering WAN links and either routers or equipment for running IBM SNA over frame-relay networks. They don't yet have the reach to include hubs, switches and other internetworking hardware. These alliances would extend the reach of carriers to user sites.

The two industries aren't wasting any time laying the groundwork for the alliances.

"We're already talking to several major carriers, including some [local carriers], about these type relationships and plan to have some in place in the not too distant future," said John Chambers, chief executive officer at Cisco Systems, Inc. "This is a very large business opportunity for Cisco."

Chambers added that Cisco users have been asking the vendor for arrangements whereby one party could provide a turnkey package.

Cisco isn't alone.

"We're talking to a lot of carriers about providing solutions that include wide-area data connections as well as hubs and routers," Masri said.

Long-distance carriers give users a price break. See page 76.

Corrections

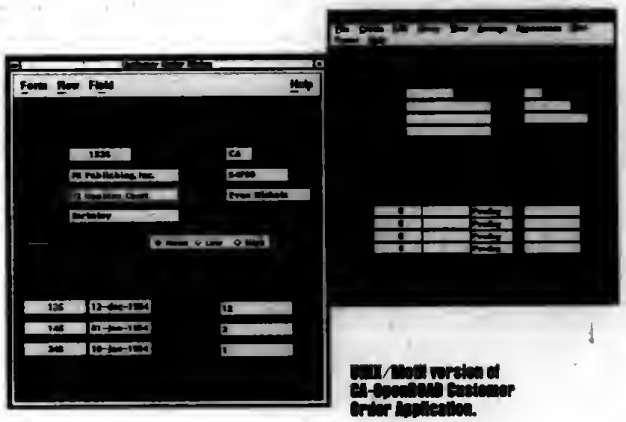
In "A bird's-eye view of large nets" [CW, Sept. 4], a quote from Mike McConnell, vice president of McConnell Consulting in Boulder, Colo., about Frontier Software Development, Inc.'s Rmon2 support was incorrect. The quote should have read, "Most vendors are adhering to Rmon2."

In "IBM's Butterfly floats, but pricing stings" [CW, Sept. 4], the correct price for the tested machine is $2,999. The price range for the product line is $2,449 to $3,999.

*****

In "Win 95 graphics make strides" [CW, Sept. 25], the phrase the "ability to multithread in Windows 95 but not in the Macintosh" was incorrect. The Macintosh System 7.5 includes a Thread Manager API that developers may use to write multithreaded applications.

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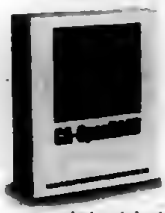
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IBM aims for middle ground

Company gives notebooks high-end features, keeps pricing affordable

By Mindy Blodgett

IBM PC Co., the acknowledged technical leader in the notebook industry, is targeting the midrange, general business segment of the market, according to Joe Formichelli, general manager of mobile computing at IBM.

To kick off its plan, IBM will announce in the next few weeks a new line of ThinkPads equipped with many features formerly found only in the high end — but now with a low-end price: $2,500 to $3,500.

"Our strategy as we end 1995 is to take the power of the ThinkPad and broaden it into the general business segment," Formichelli said. "My job is to turn this battleship a little more into the value end and focus on the fastest-growing segment of the market."

Formichelli said the new ThinkPads initially will be launched with Intel Corp. 486 processors with 19.4-in. screens and CD-ROM drives. The 486DX75 notebooks will weigh about 5 pounds. He said notebooks with 100-MHz Pentiums will follow.

The initial offerings will cost $2,500 to $3,000, with the later, faster notebooks priced closer to $3,500.

The lower-priced ThinkPads will come on the heels of the recently announced ThinkPad 760 series, which are multimedia notebooks that have 12.1-in. screens; full-motion, full-screen video; and 90-MHz Pentium processors. Notebooks with 120-MHz processors are due to follow. Those notebooks, weighing 6.1 pounds to 7.4 pounds, cost between $5,349 and $7,449.

These high prices will keep the 760 series relegated to a relatively small market. So steering its mobile offerings into general business side of things is a smart direction for the PC Co. to take, observers said.

Randal Giusto, an analyst at International Data Corp. in Framingham, Mass., said with notebook component costs dropping, it makes sense to reduce prices. "We have been seeing price compression in the market, and we expect it to continue," Giusto said. "Now that IBM is seen as the technological leader, the challenge will be for them to offer attractive features sets within a price range that can generate a lot of volume."



IBM's *Joseph Formichelli: Notebook market is broadening*

Giusto said IBM's model as it aims at the value end of the market is Toshiba America Information Systems, Inc. (see story at right). "Compaq, Texas Instruments and now IBM, they all want to knock off Toshiba," Giusto said. "It's a real challenge of marketing."

Formichelli said IBM is also ramping up production of the ThinkPad Butterfly, the subnotebook with the innovative expandable keyboard. The development team is debating whether to "try and squeeze" a Pentium processor into the small form factor, he said.

"There are lot of questions because of heat and wattage of the more powerful processor," Formichelli said. "Do people want a light, high-powered unit that is not cheap? These are the kinds of issues we are currently debating."

Ready or not

The eleventh-hour design flaw discovered in Intel's upcoming 120-MHz Pentium chip [CW, Sept. 11] for portables delayed some high-end notebook announcements, including one from Toshiba.

But Toshiba was unable to stop the advertisements already in the works by computer resellers in the monthly computer publications.

So courtesy of these ads, we know that Toshiba soon will be selling the Tecra 700 series.

At 7.3 pounds, the machine will include a 120-MHz chip, 11.3-in. screen with active-matrix color, PCMCIA slots for two Type II cards or one Type III card and a lithium ion battery. Pricing wasn't available.

Toshiba doesn't expect to officially announce the machines until later this month. Company officials won't comment on the ads.

The Toshiba multimedia machines will join the flashy multimedia notebooks that already have been announced, including the ThinkPad 760 series and laptops by rivals Compaq Computer Corp. and Panasonic Personal Computer Co.

— Mindy Blodgett

O. J. AIRWAVES



The on-line realm was bombarded with activity before, during and after O. J. Simpson's aquittal on charges of double murder

• O. J. outposts dedicated to the verdict and its aftermath cropped up on **CompuServe, America Online** and **Prodigy**. But the Internet and World Wide Web fielded far greater traffic.

• **O. J. Central**, a bulletin-board-style service on **Time-Warner, Inc.'s Pathfinder** Web site, withstood the onslaught of **240,000** hits last Tuesday, the day Simpson was pronounced "not guilty." That's **52%** more hits in one day than O. J. Central saw in the previous week, according to Richard Krueger, one of the site's webmasters.

• **Reuters** news service posted updated articles at the Web site of search facility **Yahoo** every 20 to 30 minutes last week, starting before the verdict was read on Tuesday.

• Immediately after the verdict, **CNN's O. J. Simpson Trial News** pages were intermittently inaccessible for several hours. Frustrated users trying to access the site would receive a message saying that "the server is down or unreachable."

• One of the more frenzied O. J.-related Usenet newsgroups, **alt.fan.oj-simpson**, carried more than **6,700** posts from supporters and critics alike.

• A search of **Dejanews**, a Web service that combs newsgroups for specified terms, turned up **21,609** references to "O. J." from Sept. 29, when Prosecutor Marcia Clark rested the state's case, until late last week.

— Kim S. Nash

Digital preps for Pentium Pro race

By Jaikumar Vijayan

Digital Equipment Corp. is gearing up for a series of major announcements based on Intel Corp.'s upcoming 32-bit Pentium Pro chip. The company hopes to be among the first to ship systems based on the new processors.

The announcements are slated to coincide with Intel's launch of the chip next month, and systems are expected to start shipping before the end of the year, according to sources at Digital.

The growing number of vendors lining up to announce Pentium Pro-based systems is expected to result in a flood of aggressively priced platforms based on Microsoft Corp.'s Windows NT by early next year.

Other vendors expected to make announcements around the time of the chip introduction include IBM, Compaq Computer Corp., Dell Computer Corp. and AST Research, Inc.

According to company sources, Digital will add single- and multiprocessor Pentium Pro systems to its high-end Celebris XL workstation line (see related story, page 54). The Celebris XL machines feature a scalable, processor-independent architecture that lets users upgrade their systems from Pentium processors to Digital's Alpha technology.

The Pentium Pro systems will be presented as NT-based desktop platforms positioned over Digital's Intel-based Pentium boxes but just under its Alpha-based Celebris systems. Prices are expected to reflect this positioning. Currently, a fully configured and loaded 120-MHz Pentium-based Celebris-XL costs about $6,000.

The technology is impressive, but Digital's boxes aren't expected to vary significantly from those of other vendors. The company's success will depend on pricing and its ability to execute its PC expansion plans, observers said.

Pentium Pro-based Celebris XL

PROCESSOR: 150-MHz Pentium Pro and 166-MHz Pentium Pro
BUS SUPPORT: PCI
RAM: 16M bytes
HARD DRIVE: 1G byte
CACHE: 256K-byte second level
CD-ROM: Quad-speed
SCSI: Wide and Ultra options
VIDEO: 64-bit Matrox with 3-D acceleration

Digital will have one advantage over other vendors: It will be the only company to offer users an easy upgrade path from a Pentium to a Pentium Pro. Because of the Celebris XL's processor-independent design, users of that model will be able to upgrade simply by slipping a CPU card into the motherboard.

"I think they have some really good products, but they always seem to have trouble hitting the market with the right product at the right price," said Owen Forrest, MIS director at Angelo Brothers, Inc. in Philadelphia.

Digital's new systems will be based on the 150- and 166-MHz Pentium Pro and will come with many of the same features now offered on Celebris products. These include Peripheral Component Interconnect support, a standard 16M bytes of RAM, a 1G-byte hard drive and a 256K-byte, second-level cache.

Digital will add more muscle to its systems with Fast and Wide SCSI options and 64-bit graphics with three-dimensional acceleration capabilities.

Digital also will announce uniand multiprocessor workgroup, departmental and enterprise servers based on the Pentium Pro chip, the sources said. These systems are expected to ship during the first quarter next year.

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There are many portable computers from leading manufacturers priced like the new TI Extensa™ 550. Trouble is, they probably don't come with Pentium® processors. They use DX4 or DX2 processors to power their machines. And that's just the beginning. The new TI Extensa 550 extends the power of its Pentium processor with 256KB of L2 cache, allowing the processor to work at maximum operating efficiency.

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What's more, the new TI Extensa 550 uses the same PCI circuitry found in most desktop models for blazingly fast video monitors and improved disk drive performance. The new TI Extensa 550 also comes with a serial infrared port, which lets you print or share files, wirelessly. Thus enahling the new TI Extensa 550, and its owner, to do some extraordinary things.

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Nuke tracking system falls short

GAO report slams failings of DOE computer system

By Gary H. Anthes
WASHINGTON

A new computer system used to track the nation's inventory of nuclear materials was so sloppily developed that the government can't count on it to operate reliably and accurately, government auditors said in a report released last week.

The General Accounting Office report blasted the failings of the Department of Energy's system, which is used to account for hundreds of tons of plutonium, highly enriched uranium and other materials. The GAO charged that the system was developed with inadequate planning and poor analysis of user requirements. It also falls short on documentation, configuration management and systems testing, the investigative agency said.

The Energy Department "has no assurance that the [system] will ever perform as intended," the GAO said of the Nuclear Materials Management and Safeguards System (NMMSS).

The NMMSS was converted from a mainframe-based Cobol system to an Intel Corp. Pentium-based client/server system. It runs Windows, Novell, Inc.'s NetWare and application code written in FoxPro from Fox Software, Inc. The system is used by Energy Department employees and various external organizations.

An Energy Department official disputed the GAO's findings, saying the system runs well and that any shortcomings it has don't threaten public safety.

"Obviously, we are not going to put ourselves at high risk, knowing that this is the U.S. government's system for tracking nuclear materials. But it is running fine and doing what it is supposed to do," said Richard Speidel, the management and internal controls manager for the Energy Department's Office of Nonproliferation and National Security.



He explained that the system isn't really new but simply a "translation" of an old, proven application into a new environment. Therefore, many of the systems development shortcomings alleged by the GAO are irrelevant, Speidel said.

Speidel stressed that the system is "an accounting and tracking system, not a safety or security system. If [users] have those concerns, the NMMSS is not going to help them one way or the other."

Gary Milhollin, director of the Wisconsin Project on Nuclear Arms Control in Washington, agreed that the NMMSS is only a record-keeping system. But he added, "It is vital to have both [record keeping and security] function well. If this system is used by the [Energy Department] to keep track of its stuff internally, then it's a serious problem if it's not accurate."

Milhollin said he wasn't reassured to learn that the NMMSS is functionally equivalent to the old one, which he used extensively in the late 1980s to track the movement of nuclear materials. "I found it was very hard to figure out how much we'd exported, whether it came back and where it was," he said. "The last time I looked at it, it was not a very good system, and you wouldn't make policy decisions based on it."

In a December 1994 report, the GAO recommended that the Energy Department terminate development of the replacement system and go back to square one with a project that followed "generally accepted systems development practices."

That didn't happen. The Energy Department "has not implemented any of the recommendations contained in our prior report and has no plans to do so," the audit agency said in an August 1995 report.

The Energy Department started up the replacement system Sept. 1 and turned off its predecessor Sept. 30.

Wasted effort

A multimillion-dollar system designed to help states manage hazardous waste may have become waste material itself.

The Environmental Protection Agency's Resource Conservation and Recovery Information System (RCRIS) is so hard to use that it has been largely abandoned for independent "work-around" systems, the GAO said in its latest report.

In 1991, the EPA essentially replaced a system that was "cumbersome, difficult to use and confusing" with a system that is cumbersome, difficult to use and confusing, according to the GAO.

The GAO said it cost the EPA $7.5 million to run RCRIS in 1993. A spokesman for the EPA said the agency generally agreed with the GAO's findings and recommendations.

The good news, said the GAO: "RCRIS' shortfalls have not significantly affected [hazardous waste management] primarily because it is not relied on as a key tool for managing the program."

—Gary H. Anthes

CDPD catches on slowly; more networks available

By Mindy Blodgett

When Cellular Digital Packet Data (CDPD) carriers and developers meet this week in San Francisco for their second annual conference, a formerly rare and special breed will be in attendance — real CDPD customers.

The users are a sign that CDPD is finally starting to catch on, according to CDPD Forum members.

Cellular Digital Packet Data

"A year ago, there were no customers at the forum," said Jay Sbeth, general manager of the Wireless Data Group at GTE Mobilenet, Inc. in Atlanta. "This year, we have four. I think that is a pretty good sign."

CDPD is a means of transmitting data over a wireless network via the IP. It was developed by McCaw Cellular Communications, Inc. in Kirkland, Wash., which is now called the AT&T Wireless Division.

Virginia Natural Gas, Inc. in Norfolk, Va., a utility that signed on with GTE Mobilenet, is one of the latest CDPD customers. David Weston, director of quality assurance at the utility is speaking at this week's conference. He said about 75 field technicians will be equipped with pen-based computers that will communicate on the CDPD network.

He said his company chose CDPD because the network was widely available in his area, and it "just made business sense."

Since it was first announced to great fanfare, the road toward building a nationwide network of CDPD service has been rocky. Even its strongest backers now concede it was hampered by overhype and overpromise.

A slow crawl

But the networks are rolling out slowly but surely, CDPD backers said.

Since July, when 20 CDPD networks were up and running, six more now offer full, commercial availability, according to the latest CDPD Forum report card.

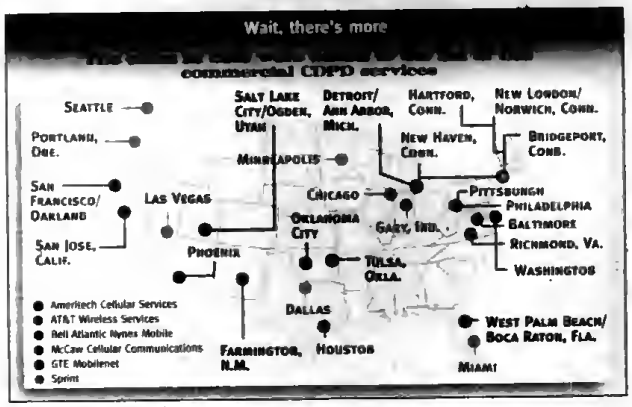
At this week's forum, CDPD applications will take center stage, according to David Coverdale, managing director of the CDPD Forum, the industry's professional organization.

One effort under way is the development of a standard for a two-way messaging protocol developed by AT&T Wireless. The protocol, called Limited Size Messaging, is based on the IP and is aimed at several devices, including laptops, pagers and the emerging "smart phone" market.

Smart phones are mobile devices that combine features of handheld computers and cellular phones.

But Iain Gillott, an analyst at Link Resources Corp. in Austin, Texas, said while some CDPD customers have stepped out of the shadows, "there is a hardly a great flood yet." Price and data transmission quality are two issues.

"I think CDPD will do very well for such things as credit-card transactions and that sort of data transmission," Gillott added. Otherwise, CDPD's future is "still unclear."



Source: CDPD Forum, Arlington, Va.

The utility industry is a big backer of CDPD. See page 52.

IBM SystemView will ship mostly as promised

Only OS/400 version of product will be delayed

By Patrick Dryden

Three out of four promised platforms isn't bad.

IBM updated the status of its SystemView effort last week, promising delivery of the integrated network and systems management software for MVS and OS/2 before year's end.

But users who want to combine monitoring and control functions on OS/400 won't see a SystemView package until the middle of next year, IBM officials said last week. That version had been promised for the beginning of the year, but IBM wants to make sure the suite works with current and upcoming AS/400 models, IBM executives said.

All together now

SystemView provides a graphical "launch window" from an OS/2-based console that coordinates management tasks previously performed separately by dozens of products running on MVS, OS/400, AIX or OS/2 systems. IBM also streamlines the order, configuration and support of tools for each SystemView platform.

An AIX version of SystemView debuted in May and inaugurated IBM's push to unify its systems and network management software across its platforms.

The upcoming SystemView for MVS is "very good news" for Art Gloster, vice provost of information technology at Virginia Commonwealth University in Richmond, Va.

"We may want to rethink our decision to adopt SystemView for AIX now that we know the MVS version is coming so soon," Gloster said.

The academic and medical university is moving several library and administrative legacy systems to AIX servers as part of a three-year project. But its mainframes aren't going away, Gloster said, so the university needs management software for MVS and AIX.

The state of Illinois has extended NetView for MVS to monitor IBM and non-IBM systems and kick off automated processes, but the promised SystemView for MVS will have to do much more to appeal to John Fry, communications software specialist for the state.

"SystemView could be a great enhancement if IBM builds in the features we get from other monitors and provides an entirely graphical view," Fry said. "Then we would require only one platform to manage everything."

SystemView for MVS, which is slated to ship Dec. 15, offers a single point of control for more than 36 applications to manage host-based and distributed computing environments, said Al Zollar, IBM vice president for SystemView.

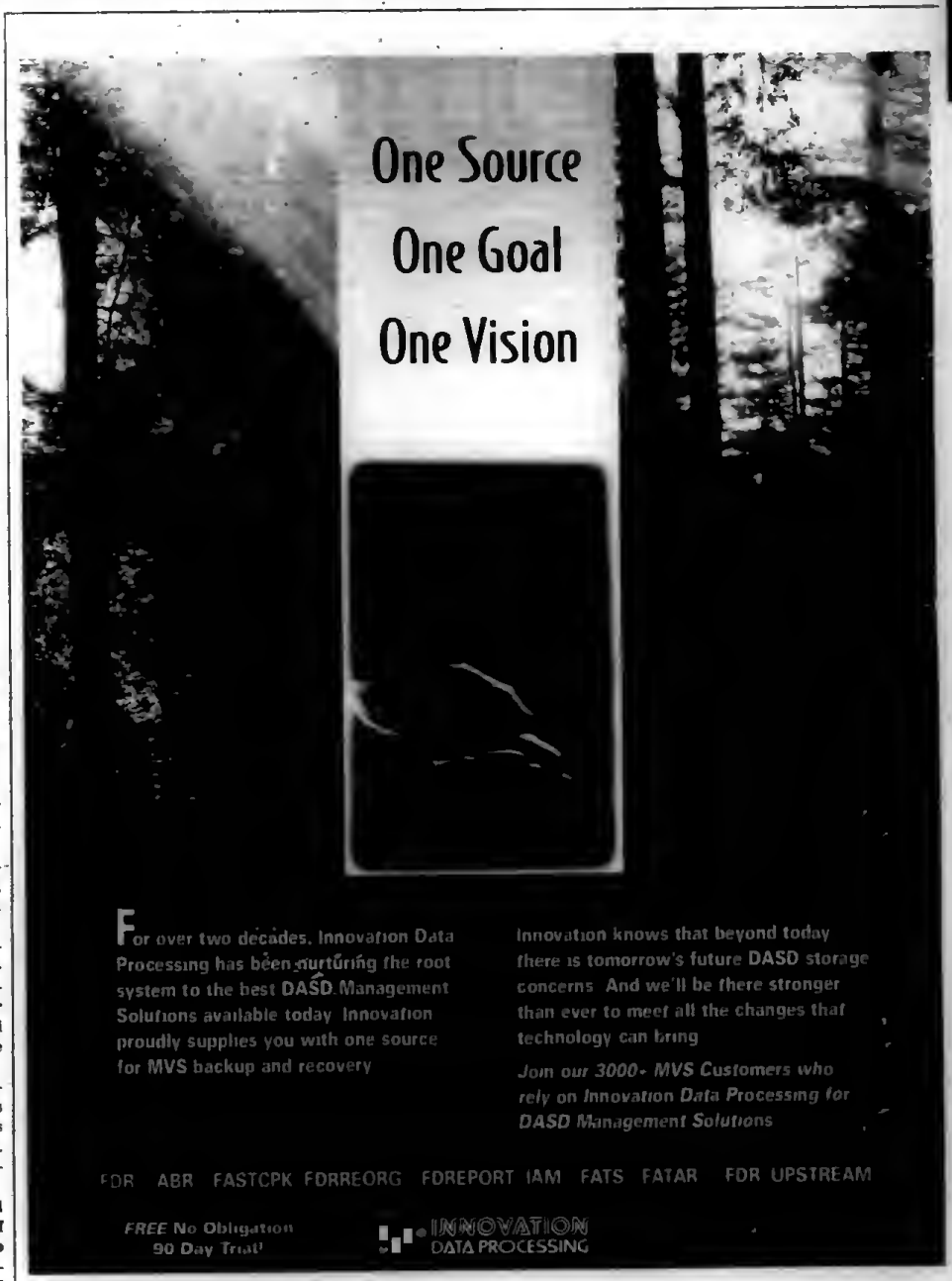
Zollar said the OS/2 console component will be free to corporate network administrators to help them automate the integration of MVS-based management applications from IBM and others.

The AIX platform makes more sense than SystemView for OS/2 because it can be scaled beyond a few workgroups to thousands of devices, said Roosevelt Giles, president of Information Management Systems, Inc. in Atlanta.

The OS/2 version, which is in beta testing now and is scheduled for fourth-quarter delivery, targets LANs up to a few hundred devices in size, Zollar said.

"The OS/400 version sounds fine — a good fit for managing desktops from all those AS/400s out there," Giles said. He added that he wished IBM could deliver a product instead of a preview.

Software to help client/server network managers is on its way. See page 69.



Sun heads toward consumer markets

By Jean S. Bozman

Sun Microsystems, Inc. is diving into consumer markets as it tries to broaden the scope of its Unix hardware and software business, Sun Chief Executive Officer Scott McNealy said last week.

Sun's technology will be embedded in a wide range of products, from TV set-top boxes to internet devices, McNealy said at Telecom '95 in Geneva.

Some Sun users said they could see the need for handheld devices to access Internet servers. But others view portable Internet devices as little more than accessories.

"There may be a niche for people who just want to read information off the Internet," said Pompi Malik, director of information systems at Brewers Retail in Mississauga, Ontario.

Analysts said the Mountain View, Calif., vendor faces an uphill fight against consumer-product heavyweight Hewlett-Packard Co. HP is expanding its retail presence next year with home PCs, handheld devices and Internet products.

"They're more likely to be outconsumered by HP because HP has the distribution channels," said George Weiss, an analyst at Gartner Group, Inc., in reference to HP's printer and PC units. Unlike HP, Sun doesn't sell PCs or palmtop computers.

McNealy offered few details about future products, but Sun last week indicated its expansion in the following areas:

- Sun this week will announce an interactive Services Group, which will focus on enterprise systems that use multimedia servers to distribute applications on networks.
- Sun's servers are part of a consumer-oriented video server system from Thomson Multimedia, S.A. in Paris that includes set-top boxes.
- Sun is co-developing an internet-ready handheld device with Toshiba Corp. in Japan. The device would be built by Toshiba but could be marketed globally by both companies, Sun executives said. The device would access Sun's Java applications that run on Sun's Unix servers.

Roger Holtom, a business technology consultant at Ciba-Geigy Corp.'s Chemical Division in Greensboro, N.C., has found a use for such devices. He plans to dial up the manufacturing site's four Sun SPARCserver 1000s, which run Oracle Corp. databases, with a handheld HP 200LX computer and a modem card. He said he paid $599 for his HP palmtop PC.

"It has a PC [PCMCIA] card slot. I'm going to throw a modem in it and be able to dial straight into the Sun machines," he explained.

On-line commerce prompts alliances

By Neal Weinberg

Telecom '95/Geneva

The convergence of telecommunications and computing got a boost last week as industry leaders including Microsoft Corp., Intel Corp. and Oracle Corp. attended their first international Telecom conference.

Telecom '95, held once every four years in Geneva, produced a raft of multinational accords that could break down some of the barriers to full-fledged global telecommunications.

The major change in the past four years has been the rise of the Internet as a potential vehicle for electronic commerce, analysts said.

Traditional computer companies are looking for ways to get in on the action — and that means making deals with telecommunications companies that carry Internet traffic.

Highlights of last week's conference include the following:

- **Microsoft** forged an alliance with seven international communications companies to make Windows the preferred platform for conducting business on the Internet.

Under the alliance, the telecommunications companies and Microsoft will define open Internet standards for security, directory services and high-quality transmission of audio and video.

- **AT&T Corp.** rounded up Deutsche Telekom, NTT, Telstra and Unisource, a European consortium, as well as technology providers Lotus Development Corp. and Novell, Inc., to offer global multimedia services.

AT&T is combining Network Notes, its wide-area version of Notes groupware; NetWare Connect Services, which link LANs; and WorldWorx Solutions, which provides desktop videoconferencing. AT&T will license the technologies to telecommunications companies around the world that agree to adopt common protocols and platforms.

- **Lotus** announced license agreements with 11 global communications carriers to offer Notes on their public data networks. The move is aimed at making the Notes groupware system a business standard in worldwide communications — much the way faxing became the standard for interoffice communication.
- **Hewlett-Packard Co.** showed off a handheld device, which it will ship in the first quarter next year, that combines a laptop computer and a mobile phone. The HP Gmnigo 700 lets users send short messages and faxes or download data files.

The IDG News Service and Computerworld *senior editor Cheryl Gerber contributed to this story.*

News Shorts

Perot lands Cannavino

James Cannavino, a former senior vice president of technology at IBM, last week was named president and chief operating officer of systems integrator PerotSystems Corp. Cannavino said he hopes to broaden the services Perot provides and help take the company public soon. Cannavino retired from IBM with the expressed goal of heading up a major company. Though the position is a second-in-command slot, Cannavino said, "as president and chief operating officer, if I do a good job, I'll get more responsibilities. If I do a bad job, they'll move me back to the mailroom."



Former IBM *executive James Cannavino*

Study highlights IS flaws

Less than half of information systems projects come in on time and within budget, according to a recent survey of controllers at 420 companies. The result? Financial managers increasingly view outsourcing as a viable alternative to internal development, according to the survey, conducted by the Controllers Council of the Institute of Management Accountants. Thirty percent reported that their companies' IS projects were over budget, 40% said projects were completed behind schedule, and 1% of controllers reported projects completed early.

Sun boosts SPARCservers

Sun Microsystems, Inc. boosted its high-end Unix servers this week. With an upgraded processor, the new systems will be up to 40% faster than current models, Sun said. The upgrades cost $5,000 per CPU for older SPARCserver 1000E machines and $9,995 per CPU for SPARCcenter 2000E machines.

Nissan names Koeller

Richard Koeller has signed on as director of IS at **Nissan Motor Corp.** in Gardena, Calif. Koeller, a Chicago-based consultant, previously held IS executive positions at Whirlpool Corp. and TRW, Inc. Koeller replaces Evan Wride, who recently joined AST Research, Inc. in Irvine, Calif., as vice president of IS.

New DB2 version lurks

IBM this week will announce general availability on a long-awaited new version of its DB2 database for mainframes. Detailed more than a year ago, Version 4 of DB2 for MVS adds a variety of features already available in Unix databases, such as stored procedures, row-level data locking and the ability to split queries between multiple processors.

Intel performance lags

For the first time, **Intel Corp.** appears to have slipped behind a clone maker in X86 performance. **Cyrix Corp.**'s 6x86, code-named M1 and announced last week, outperforms Intel's top-of-the-line Pentium Pro in many standard benchmarks. The 100-MHz 6x86, which is due in volume in the first quarter next year, doesn't appear to mean lower prices for users any time soon, though, analysts said.

Encore introduces new array

Encore Computer Corp. in Ft. Lauderdale, Fla., this week will introduce the SP40, an expanded version of its Infinity SP disk array that supports data sharing between mainframes and other servers. Scheduled to ship this quarter, Multiple SP40 controller nodes can be linked together, with each group of two supporting up to 689G bytes of disk storage, Encore said. The SP40 is scheduled to ship this quarter.

Microsoft, MCI deal

Microsoft Corp. outsourced call center management of its Microsoft Network (MSN) technical support operations to **MCI Communications, Inc.**, the companies said last week. Separately, Microsoft, MCI, and six other telcos, said they plan to build a nonproprietary, worldwide adjunct to the Internet. They revealed no time frame for the plan.

SHORT TAKES Wilmington, Mass.-based Lycos, Inc. added several features to its Internet search engine last week, including graphical interfaces and the ability to support animation.... **Stac Electronics** in San Diego this week will announce Replica, data protection software for Novell, Inc. NetWare servers; it will be available in November for $995 per server.

Boeing Takes Off With The Flying Dutchmen



The Boeing Commercial Airplane Group took off with the 777 this year; they also took off with the Baan Company. About to make a major process redesign commitment, they invited in "The Flying Dutchmen" from Baan Company. The result: Boeing placed an initial order valued at $20 million for Baan's TRITON family of client-server finance, manufacturing, distribution, transportation, service and project management applications.



If you are about to make an ERP decision, Baan's Flying Dutchmen would be delighted to introduce you to a significantly new perspective. One shared by ABB, Hitachi, Mercedes-Benz, Philips, Snap-On Tools and ... oh yes ... by Boeing. The worst that can happen is that you'll get a free hat commemorating Boeing's taking off with Baan. Call Baan at 800-889-9818, ext. 1001. Then clear a landing spot, along with some time on your calendar.

BAAN

The Flying Dutchmen

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TRBA

Apple wrangling worries Mac faithful

By Lisa Picarille

Some industry observers interpreted the abrupt resignation of an Apple Computer, Inc. executive last week as a sign that the company's troubles are worse than they seem.

For Macintosh users, the publicized struggle between the company's top officers was disheartening.

"We love the boxes and are suspicious of the people, but we've always felt that way about Apple," said Harry Mott, a broadcast designer and educator at the American Film Institute in Los Angeles. "There are some wonderful people at the company, but they don't listen to their users."

Some said the departure of Apple Chief Financial Officer Joseph Graziano was merely the fallout of an internal political struggle. Graziano resigned after a reported boardroom battle with Michael Spindler, the company's chief executive officer.

Sources inside Apple said Graziano recently sent letters to board members detailing the seriousness of Apple's problems. Then at last week's annual board meeting in Austin, Texas, the CFO made a plea to sell or merge the company.

But Apple denies that was the case. "No, [Graziano] did not try and stage a coup. It was a difference of opinion," said Apple spokeswoman Pam Miracle, who declined to comment further.

"All this internal maneuvering makes me wonder how stable the company is and if we should continue to purchase products from them," said one manager at a large West Coast movie studio, who asked not to be named.



Apple's CEO Michael Spindler: *Backed by board of directors*

Some analysts took Graziano's resignation as a sign that Apple's recent spate of troubles is escalating. Those problems include an expected loss for the fiscal quarter ended Sept. 30, chronic component shortages, failure to meet demand for some products and quality control issues that recently caused some of its high-end PowerBooks to catch on fire.

"This is a bad sign in the sense that Graziano is right about the severity of Apple's current situation," said Kurt King, an analyst at Montgomery Securities, an investment banking firm in San Francisco. Graziano "is the most important voice of dissent at Apple right now."

Yet some industry watchers backed the board's decision to stay the course with Spindler. "I don't understand why Wall Street is so enamored of Graziano," said Jeff Matthews, a general partner at RAM Partners, an investment banking firm in Greenwich, Conn. "Graziano just kept telling financial analysts that everything would be OK next quarter, next quarter. After a while, I just stopped listening to him."

"I think this is a better thing than if Spindler left and Graziano stayed," said Pieter Hartsook, editor of "The Hartsook Letter," an industry newsletter in Alameda, Calif. "A change in CEO would be extremely disruptive to work in progress," such as the Common Hardware Reference Platform and the Copland operating system.



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Storage management to bridge Unix, MVS gap

By Steve Moore
DENVER

Hoping to blast past competitors in the fast-paced storage management market, Storage Technology Corp. last week unveiled products that meld Unix and mainframe storage management.

At the company's Forum user conference in Denver last week, StorageTek officials said the products (see chart) will be available in the first quarter of 1996. The company also laid out an ambitious road map for future network-based, multiplatform storage management offerings that span tape, disk and solid-state media.

Storage management

StorageTek users welcomed the integration.

"I'm very encouraged by seeing products that bring what I call industrial-strength equipment to the Unix or open systems side" as well as to the mainframe side, said Tom Loane, vice president of information services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla.

With regard to storage management across MVS and Unix, Loane said, "we don't need to do some of the things they are offering [in the new Enterprise Volume Manager and Expert Volume Manager products], but we are going to very shortly."

Analysts said StorageTek's action was inevitable. "Companies that were in single operating system environments are attempting to expand their markets by moving into client/server computing," said Fara Yale, a principal analyst at Dataquest, Inc. in San Jose, Calif.

By so doing, StorageTek "will encounter companies that are not their traditional competitors," including Hewlett-Packard Co. on the hardware side and Palindrome Corp., Arcada Software, Inc. and other client/server storage management software vendors that are developing enterprise products, Yale said.

StorageTek's notion of "virtualized" tape or disk storage is "basically middleware that sits between applications and the storage repository and masks where storage is physically located," said Mike Peterson, president of Strategic Research Corp. in Santa Barbara, Calif.



While it would greatly benefit users to get the various vendors together on standardization of mainframe and client/server storage management systems, Peterson said, "they will all do it differently."

Nearnet takes backseat

StorageTek executives said new technology from recently acquired Network Systems Corp. (NSC) in Minneapolis will supersede StorageTek's Nearnet network backup product.

The executives said the company's long-term strategy, code-named Callisto, calls for use of virtual LAN and security technologies in NSC's Asynchronous Transfer Mode network switching products. Future StorageTek products will give multiple, overlapping groups of users enterprisewide secure access to specified storage resources, including non-StorageTek storage systems, they said.

IBM tape drive hits big snag

By Craig Stedman

IBM claims to have seen the light when it comes to the tape drive business. But now it will be almost two years before commercial mainframe shops see a useful version of the company's new high-capacity Magstar drive.

Officials at IBM's storage division last week said a shift of money and engineers away from tape has been reversed following a midsummer management shakeup. As part of the tape renewal, the company has brought back to life a midrange derivative of Magstar that had been killed earlier this year.

However, IBM also delayed shipments of the mainframe Magstar for the second time in two months. Originally due out this year, the drive now won't ship until the fourth quarter of next year, the company said. Even worse, a key feature that will let customers put multiple data sets on the 10G-byte Magstar cartridges isn't scheduled to be ready until the first half of 1997.

Pumping it up

IBM will have to increase the capacity of a planned 5G-byte midrange offshoot of Magstar to compete with tape technologies that are reaching the 20G-byte level, said Stan Corker, an analyst at International Data Corp. in Framingham, Mass. Staying pat "would be pretty disastrous," he said.

That opens the door to continued domination of the mainframe tape market by Storage Technology Corp., which already controls almost 60% of shipments, according to International Data Corp. in Framingham, Mass. Until Magstar includes its so-called, volume-stacking feature, IBM's hands are mostly tied.

Delay disappoints

The Magstar delay "is very disappointing," said Bill Neuser, manager of capacity planning and support at Great Western Bank in Northridge, Calif. The bank has two of IBM's high-end 3495 tape libraries and is on a Magstar customer steering committee that IBM set up.

"It's one thing if it's a little harder to do than IBM thought, but it's another thing if they cut too many people in their zeal to please the investors," Neuser said.

"Until they have volume stacking, Magstar doesn't make sense to me at all," said Paul Moore, manager of data processing operations at Huntington Bancshares, Inc. in Columbus, Ohio. Most mainframe shops use up only "a fraction" of the capacity on 3480 and 3490 tapes, which top out at 800M bytes, he said. Without volume stacking, even more space would be wasted with Magstar.

The 3495 and IBM's smaller 3494 library "are kind of lackluster" with existing 3490E drives, said Paul Wolfstaetter, an analyst at Gartner Group, Inc. in Stamford, Conn. IBM's position will become even more precarious early next year when StorageTek ships software providing host-based volume stacking for its TimberLine and RedWood drives, he added (see story above).

Barbara Grant, general manager of a new tape and optical unit at IBM's storage division, said tape's second-fiddle status to disk drives — in terms of resource allocation — contributed to the Magstar delays. But new funding has been secured for tape development and marketing, and staffing is on the rise, she said.

IBM is looking at the possibility of enhancing Magstar before the mainframe version even ships, Grant said. Among the moves being considered is an increase in cartridge capacity. A finished plan should be ready in four to six weeks, she added.

More details will also be provided then on the revived midrange offshoot of Magstar. That drive, code-named NTP-2, would target at IBM's AS/400 systems and servers running Unix or Windows NT.

Kodiak array adds zip to StorageTek disks

By Craig Stedman

Storage Technology Corp. last week introduced its Kodiak mainframe disk array, a faster and more conventional RAID device than its original Iceberg. Kodiak should broaden StorageTek's reach into the mainframe disk market and may usurp Iceberg as the company's leading array.

As expected, StorageTek executives went to great lengths to clarify how Kodiak and Iceberg fit together. The two arrays use completely different architectures, and some customers said StorageTek hadn't explained its strategy clearly enough before it announced Kodiak [CW, Sept. 11].

THE BEAR FACTS

STORAGETEK'S KODIAK DISK ARRAY FOR MAINFRAMES INCLUDES THE FOLLOWING FEATURES:

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- SHARED CACHE: 256M BYTES TO 4G BYTES
- ESCON I/O CHANNELS: FOUR TO 16
- DEVICE CONTROLLERS: TWO TO 12
- LIST PRICE: $609,100 TO $8.8 MILLION

Setting it straight

Clearing up that confusion "is the biggest thing on our minds right now," said Mike Saunders, director of on-line product marketing and planning at the company.

Iceberg "remains our flagship product" because of advanced features such as data compression and self-management, which aren't in Kodiak, he said. He added that Kodiak's higher performance — which beta testers put at three to four times the I/O throughput of Iceberg — is aimed at the top 20% of customers craving raw power.

However, industry analysts said Kodiak's zip should appeal to a much wider constituency.

"The world is not very rational, and everyone wants to buy the fastest box they can find," said Robert Gray, an analyst at International Data Corp. in Framingham, Mass. Kodiak and Iceberg shipments could be "neck and neck" in 1996, helping StorageTek gain market share, he added.

While Iceberg users were comforted by StorageTek's positioning of the two arrays, they agreed Kodiak may play well beyond its intended niche.

"I'm still convinced there's some future value in [the advanced functionality that Iceberg provides], but I think there is overlap between the two arrays," said Larry Duntz, assistant manager of computer services at Beech Aircraft Corp. in Wichita, Kan.



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Making mainframes less menacing

IBM bundles MVS with key supporting products; database and transaction bundles to follow

By Craig Stedman

IBM's announcement this week of plans to bundle its MVS operating system with about 30 supporting products is likely to be followed by more packages that will produce load-and-go System/390 database and transaction servers.

The bundled OS/390 version of MVS, which IBM confirmed was in the works this summer [CW, Aug. 21], is the first step in a repackaging effort to make the mainframe software cheaper and easier to buy, install and test, company officials said.

To make mainframes less imposing in a client/server age, IBM is also considering integrating OS/390 with products such as its DB2 database and CICS transaction monitor, said Charles Lickel, vice president of System/390 business plans and systems architecture. As with IBM's SystemView systems management line, customers would order from a menu of products and receive a single pretested environment (see story, page 7).

OS/390, which combines MVS with communications, application development, job scheduling and distributed computing software, will ship in the first quarter of 1996. While pricing has not been finalized, Lickel said the bundling could result in savings of 25% to 30% at large mainframe shops and 50% at smaller shops.

The packaged servers, which would likely bring additional savings, also "will be something we get into in 1996," Lickel said. But it isn't clear if those products will actually ship next year. IBM is still investigating the packaging concept, and plans "aren't nailed down" yet, he said.

Mainframe customers said both the cost and complexity of System/390 software have to be reduced to enable mainframes to hold back the tide of smaller machines based on Unix and Microsoft Corp.'s Windows NT operating system.

"To put up an operating system on a Unix box is way less expensive than it is to install MVS," said Virgil Pittman, senior vice president of information systems at Fireman's Fund insurance Co. in Novato, Calif. Fireman's Fund pays $3 million a year for mainframe software. That "has to become more competitive," and IBM's plans seem to be the right idea, he said.

Other users agreed that the OS/390 and packaged server concepts should help reduce their software installation and testing workload at a time when support staffs are shrinking. Installing System/390 software today "is a pain," said Phil Davis, director of technical services at Mazda of North America, Inc. in Flat Rock, Mich. "It just takes so much time on my technical people."

However, some customers noted that a high percentage of their cost and installation headaches are caused by other mainframe software vendors. IBM's repackaging pills won't help ease that pain, they said.

Jeff Grigg, principal technical support analyst at Bath Iron Works Corp. in Bath, Maine, said IBM also runs the risk of overloading customers with too many changes at one time. OS/390 may help cut the ship builder's operating system installation cycle of three to four months. "But trying to change your MVS, DB2 and CICS environments is a big chunk to bite off in one weekend, even if it all installs perfectly," he said.

Circus of servers

System 390 division in making announcements this week

AS/400:

- Support for dividing database queries across multiple processors in a single machine or up to 32 interconnected systems
- Data propagation software for updating multiple databases
- Deals with third-party vendors to port data warehousing tools to the AS/400

RS/6000:

- RS/6000 E20 low-end workgroup server, based on the PowerPC 604 microprocessor and PCI bus; price starts at $9,995
- Internet browser software and adapters for ATM networks and Serial Storage Architecture disk drives

PC SERVERS:

- Low-end PC Server 310 and high-end PC Server 520 supporting dual CPUs
- New versions of NetFinity server management software and ServerGuide installation tool
- OS/2 Version 2.11 with expanded symmetrical multiprocessing support

IBM adds features to its RACF security program. See page 92.

NetWare, Win 95

CONTINUED FROM COVER 1

vices (see story below).

The news isn't all bad, however. Users will be able to deploy Microsoft's counterpart software — Microsoft Client for NetWare Directory Services, which ships this week, said Clark Heindl, a Windows 95 product manager.

A quick cruise of the on-line forums showed that problems associated with setting up support for long file names in a mixed Windows 95/NetWare environment topped the list of about 10 problems that users most frequently encountered.

Other oft-cited integration woes were mostly technical yellow alerts, including the inability of the Windows 95 Explorer utility to recognize certain types of network adapter cards, the failure of the NetWare log-in script to run under Windows 95 and the failure of the NetWare log-in script to load Windows 95-based terminate-and-stay resident programs.

Dele Oredugba, a senior systems design analyst at United Air Lines in Chicago, said that once the airline overcame some initial "teething" problems, such as installation and some hardware configuration glitches, the integration went very smoothly. He said Windows 95 failed to automatically detect certain network adapter cards in the final stages of installation on about 10% of the 100-plus PCs on United's pilot network.

Dan Schuffert, a senior systems programmer at Stone Container Corp., a paper manufacturing firm in Chicago with 30,000 users worldwide, said he was most interested in setting up support for long file names within Windows 95.

"It speeds access of old files and directories and obviates the need for us to buy third-party software to accomplish the task," he said.

Kelly Dwyer, global information technology director at Braxton and Associates in Boston, said the problem with implementing support for long file names in a mixed Windows 95/NetWare environment results in accessing the wrong files from a NetWare server (see box at right).

"God created blind dates so that people could discover the good or bad news about the other person *before* they got involved with them, not after," Schuffert said.

OS/2 Warp Server gets rave reviews. See page 49.

Helpful hints

The following are tips for integrating NetWare with Windows 95 from NetWire system operators on Novell's CompuServe forum and from Microsoft product manager Clark Heindl.

Heindl said problems most often crop up when users try to get long file name support for Windows 95 files attached to NetWare 3.11 networks. Here is the two-phase work-around:

- Download a patch called 311PTD.EXE from NOVLIB on Netwire or FTP Internet.
- Load PATCHMAN.NLM and OS2OPNFX.NLM in AUTOEXEC.NCF.
- Load OS2.NAM in STARTUP.NCF.
- Type ADD NAME SPACE OS2 TO VOLUME <volume> at the server console.
- Register long file names with REGEDIT.EXE.

After enabling long file name support on the NetWare volume, add these to the System.INI file located in the Windows 95 directory: Support LFN=1 or 2.

Number 1 enables long file name support for NetWare Version 3.12 and later; number 2 enables long file name support for all NetWare servers, including NetWare 3.11.

A Netwire regular offered this further tip. "If you add the name space to SYS without having OS2.NAM supplied on the path you load the server from, then the volumes will not be mounted on rebooting the server," he said. — *Laura DiDio*

Hold on tight

Users anxiously awaiting the general beta release of Novell's 32-bit Client Requester for Windows 95 will have to hold on for at least another month, Novell executives said last week.

Client Requester for Windows 95 will allow Windows 95 workstation users to access all NetWare file, print and directory services. It is currently in limited beta to about 300 users.

According to Willy Donahoo, Novell's director of marketing, the Provo, Utah-based company delayed widespread beta release of the product to ensure "that it will be a good, solid representation of the client software we will ship. There's incredible demand for the 32-bit requester; we want to ship a viable beta that makes a good first impression."

Donahoo acknowledged that Novell is a little late but said "there's no specific problem" with the requester. "We expect to release a beta version to the general public sometime in November, but we're not going to give a specific ship date," he said.

But according to a user who got an alpha copy of the product, Novell initially encountered problems with the installation process.

"That problem has since been fixed, and it's showing tremendous speed and performance now," said the user, who requested anonymity.

— *Laura DiDio*

SunSoft expands net management

By Patrick Dryden

SunSoft, Inc. will deliver part of the long-promised scalability for its SunNet Manager network management platform by adding two new flavors this week.

Solstice Site Manager, a cheaper version of SunNet Manager, supports LANs of up to 100 nodes and addresses the needs of small sites or branch offices. It can report to a more capable Solstice Domain Manager, which handles 1,000 to 3,000 nodes in a campus or wide-area network, according to SunSoft. Both products build on the company's SunNet Manager and Cooperative Consoles.

"Now users don't have to bite the whole banana to get into the Solstice line," said Charlie Robbins, director of communications research at Aberdeen Group, Inc. in Boston.

New network management wares from SunSoft

Solstice Site Manager

- Limited platform for PC LANs and small networks — up to 100 nodes.
- Stand-alone manager or can send reports to a domain manager.
- Price: $1,995

Solstice Domain Manager

- Platform for large sites — 1,000 to 3,000 nodes — or multiple sites.
- Receives reports from sites and can interact with other domain managers.
- Price: $9,995

Solstice Site Manager costs $1,995; the basic SunNet Manager platform costs $5,000. Users can upgrade SunNet Manager to Solstice Domain Manager to receive reports from Solstice Site Manager LANs and gain network layout tools for $5,500.

"That's always been the knock on SunNet Manager: It's good for workgroups but couldn't take on large environments," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

The additions clear some doubt among users and improve the product line, but SunSoft has to ramp up delivery of the top-of-the-line version of its network management platform that it promised more than two years ago, McConnell said.

This version, Solstice Enterprise Manager, was designed to manage more than 10,000 nodes. It has been released only to partners such as telecommunications providers that need time to develop large-scale applications. General availability isn't expected until mid-1996.

This week's move should help SunSoft stem the feeling among users that its software is limited to workstation networks, said Rick Villars, director of network management research at International Data Corp. in Framingham, Mass.

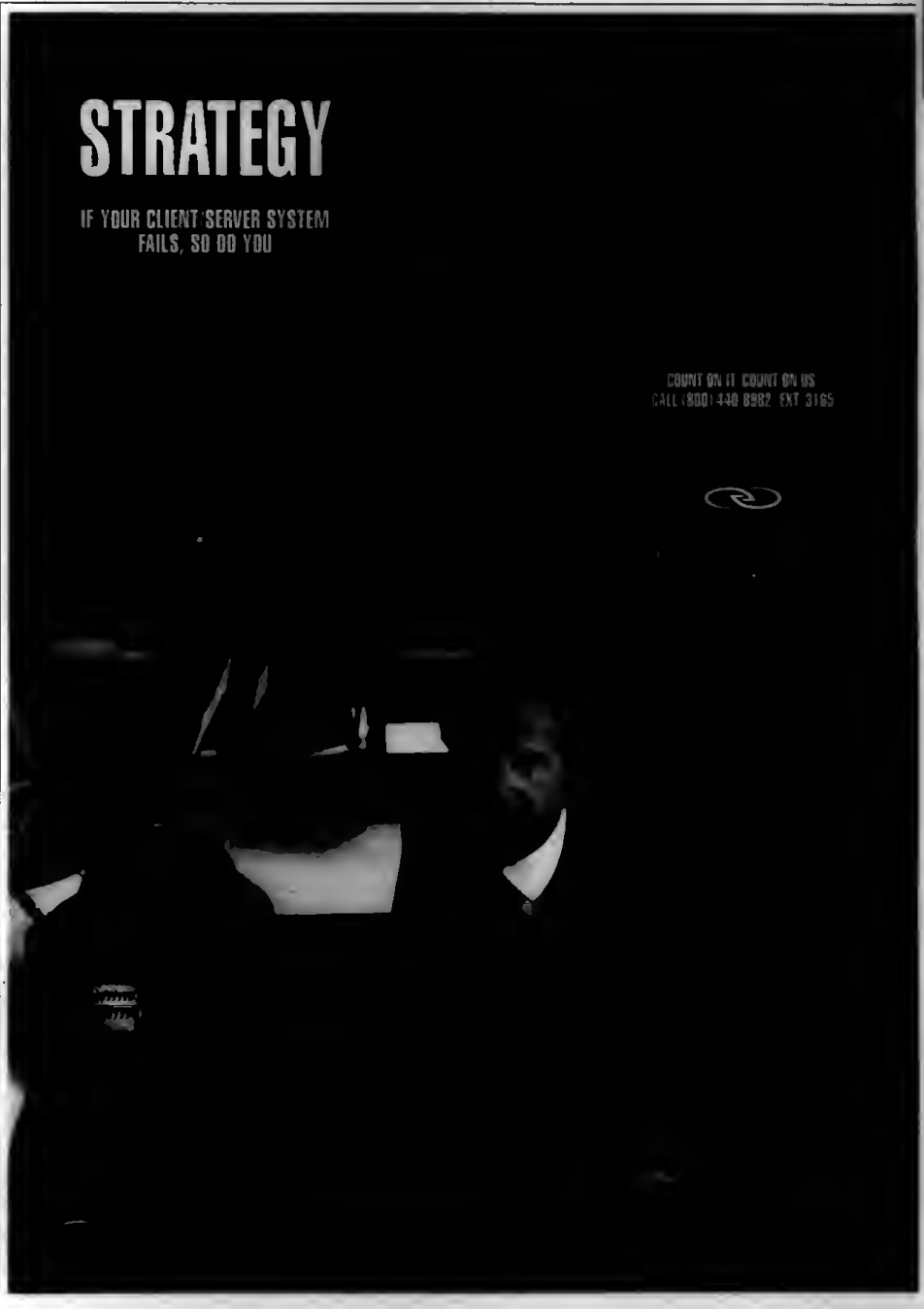
Monitor manufacturer Radius, Inc. wants to migrate to Solstice Domain Manager to maintain central control over five regional offices. "My main interest is the ability to set up remote consoles, so we won't require highly paid and skilled network staff in each office," said Ian Duffield, vice president of information systems at Radius.

British Columbia Systems Corp. (BCS), the Victoria-based telecommunications utility for the province, will stick with older, already installed copies of SunNet Manager while it beta-tests Solstice Enterprise Manager.

The utility doesn't have any locations where the 100-node Solstice Site Manager "is adequate," said Keith Finnie, manager of network management systems at BCS.

Even if SunSoft reassures users with the scalability of the new products, concern remains about the depth of application support.

"SunSoft still can't get around the perception among management application developers that SunNet Manager is not a long-term platform," Villars said.



Help wanted

IS managers 'recruiting like crazy' in tight job market

By Mitch Wagner

While the rest of the country heads to New England for leaf peeping, information systems managers will be poring over stacks of resumes this fall.

Managers, recruiters and industry experts say this season is shaping up as one of the toughest in memory for finding qualified, talented IS staff.

"We're recruiting like crazy, we're training, and we've been hiring," said Ritch Gaiti, first vice president of advanced office systems at Merrill Lynch & Co. in New York. "We've been successful, but it's difficult."

Demand is highest in emerging technologies such as object-oriented programming, networking and client/server computing, where skilled IS staffers are rare.

What are companies doing about it? Paying more, for one. IS managers say they will pay up to 40% higher salaries in emerging technologies than in more commonplace systems.

"Most people who know anything about [Microsoft Corp.'s] Windows NT are working right now, and working hard," said Bart Schempp, vice president of technology and management information at Norwest Bank Minnesota NA in Minneapolis.

Duncan Wilcox, director of investment technology at Nicholas-Applegate Capital Management in San Diego, agreed. "A reasonably seasoned developer, someone with four or five years' experience in our segment of the market, is commanding between $80,000 and $100,000 as a base salary." A programmer with equivalent skills and experience in Cobol earns about $50,000, he added.

Let's hang on to what we've got
(Tips for keeping your IS people happy)

- Set reasonable expectations upon hiring. Don't make bogus claims about the company and its work environment.
- Offer retraining and professional development opportunities. Not only does your department get needed skills, but employees feel stimulated by new ideas and worry less about becoming obsolete.
- Give employees challenging work to do and pay competitive salaries. (But you already knew that, right?)

The capital management firm also knows that gadgets are the way to a techie's heart. The company subsidizes Integrated Services Digital Network connections to the homes of IS staff and gives employees access to top machines. "One of our top developers has three machines at home, so he can try new operating systems and tools," Wilcox noted.

New employees aren't the only ones benefiting from the surge in demand. Companies are offering raises to staff members to make them less likely to accept other job offers.

"They throw them lots of money and give them stock options — same as with other valued employees," said Alexis de Planque, a research analyst at Meta Group, Inc. in Stamford, Conn.

Retraining engenders loyalty

Companies also are retraining staff to boost in-house expertise in newer skills. "The guy who gets a chance to learn new technology is more likely to have some loyalty to a company and stays motivated. He also knows [the] business already," said recruiter Bill Grady, a partner in Romac International, Inc. in Boston.

Many firms also toss around perks and benefits to court valued employees. These include traditional goodies such as health club memberships, day care subsidies and corporate entertainment.

But employers also are trying new ways to win employees' hearts.

At Progressive Insurance Co. in Cleveland, the information technology staff and other employees can get subsidized shoulder rubs from part-time masseuses who visit the corporate offices. At Thompson & Thompson Municipal Market Data in Boston, management recognizes that IS staffers frequently work through lunch. So management buys the meals and has them delivered.

Systems integrators provide client/server training options. See page 87.

Team building and heart warming

Jerry Gregoire has been through most of the executive team-building courses out there. And he's pretty sick of them.

As the vice president of information technology at Pepsi Cola Co. put it: "You leap from tree to tree and swing on ropes. You spend the whole day running around in the woods, and when you're done with the whole day, you wonder what you accomplished."

So when it came time to do a little team building in Pepsi's Somers, N.Y.-based IS department recently, Gregoire decided to try something a little different. The staff gathered tools and went off for a day to Children's Village, an orphanage in Dobbs Ferry, N.Y.

The IS folks renovated buildings and spruced up the grounds. They achieved all the benefits of pop-psychology team-building courses — with some real-world accomplishments to show for it, Gregoire said. "The kids were very grateful. You could see how excited they were," added Cristen Irving, manager of communications and professional placement for the IS unit.

The day involved 350 of the 400-person IS staff. About 50 people stayed behind to keep Pepsi's systems running. — *Mitch Wagner*

Software stars

CONTINUED FROM COVER 1

Pekkan added.

But even more common and far more disruptive are raids on SAP-savvy IS departments where recruiters, Big Six consulting companies and competitors all pursue experienced talent. Six Six firms have been especially aggressive as they look to cash in on SAP's phenomenal growth and Oracle's burgeoning success in the client/server applications market.

SAP gap especially acute

Andersen Consulting, for example, has 1,750 SAP-trained consultants now but expects to have 3,500 by next year, according to estimates from International Data Corp. (IDC) in Framingham, Mass. And Deloitte & Touche will nearly double its 800 consultants to 1,500 by next year, IDC said.

"We've had more trouble with our [SAP] consultants being hired away by other consultants," said Gary Banks, director of center of technical expertise at Monsanto Corp. in St. Louis, which is implementing SAP's R/3 applications software.

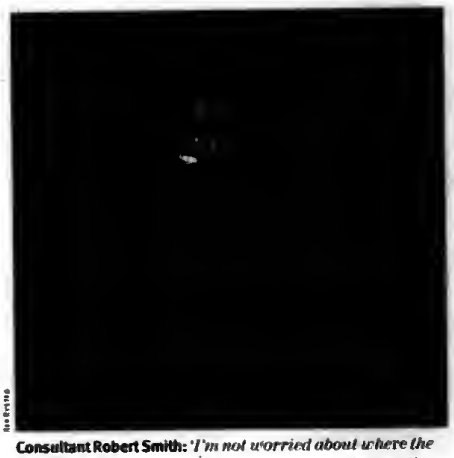
Since July, Elf Atochem North America, Inc. in Philadelphia has lost three in-house SAP experts, all of whom were trained at company expense.

Sprint Corp. in Kansas City, Mo., similarly has been left high and dry by Oracle experts lured away by higher salaries and fat bonuses. After Sprint lost two of its best Oracle database administrators to two different companies — at starting salaries near the $90,000 mark and signing bonuses of $7,000 and $10,000, respectively — three Sprint managers volunteered to fill their jobs.

But what the managers *really* wanted was Oracle training, so they could go elsewhere, too, and command bigger salaries, said Cloene Goldsborough, director of data resource management.

"I know people are getting calls because I get calls — sometimes two or three times a week, sometimes more," said Ben Vettese, SAP implementation manager at Elf Atochem.

Typically, he said, the calls are from consulting companies offering to pay him at least 25% more than what he currently earns. But Vettese said he remains at Elf because he prefers not to travel, enjoys a good relationship with his manager and feels secure in his current managerial position.



Consultant Robert Smith: *'I'm not worried about where the next contract or job is going to come from. As long as the technology keeps changing, the demand is not going to fizzle out.'*

Confident independence

Robert Smith specializes in Oracle applications and database administration in the Seattle area. He also feels quite secure in his employment, even though he works as an independent consultant.

"I'm not worried about where the next contract or job is going to come from," said Smith, who previously worked as an Oracle employee and as a consultant at Electronic Data Systems Corp.

"As long as the technology keeps changing, the demand is not going to fizzle out. It takes a few years to build a reputation, but once that happens, everything else starts to snowball," he said.

This year, Smith said he expects to net close to $100,000, primarily from an 18-month, $250,000 contract he has with McCaw Cellular Communications, Inc. He also works at The Boeing Co., where he earns $195 an hour as a subcontractor for Oracle's worldwide support organization.

Smith said he typically works 12 to 14 hours a day, except when the companies are closing their books at the end of the month. Then he works even longer hours.

"I wear a beeper all the time," Smith said, "and sometimes I'd just like to throw it."

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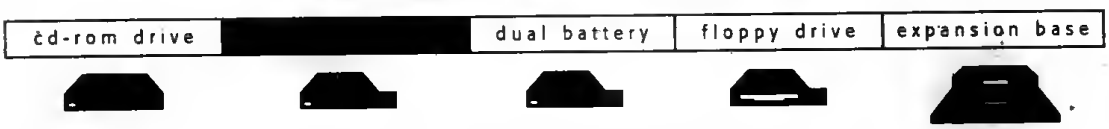
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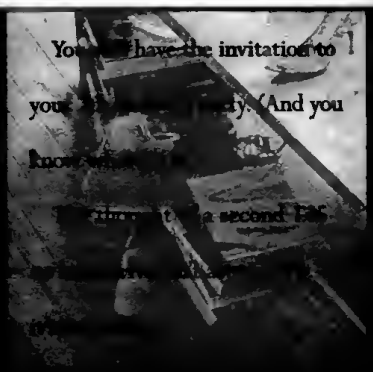


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COMPAQ

IBM spells out its internetworking agenda

By Bob Wallace

IBM last week launched a broad product initiative that spans all segments of the corporate networking market, from high-end switches to remote access wares for small sites and mobile workers.

Key among the new and planned products are Ethernet and Token Ring switches that can be easily and affordably scaled from low-end configurations to heavy-duty systems — with high-speed uplinks — using special new cards.

Analysts said the expansion capabilities would be critical to user acceptance and implementation of LAN switching.

"When we conducted our user survey earlier this year, users said the primary capability they want in switches is flexibility," said Michael Howard, president of Infonetics Research Corp. in San Jose, Calif. "IBM's delivering this with cards that can be used to add switch ports or high-speed uplinks."

One longtime IBM user hailed the introduction of Universal Feature Cards (UFC) for the vendor's LAN switches (see chart). "The reason this is an attractive strategy is that when we move [our backbone network] toward ATM, all we have to do is put an ATM UFC in our switches and protect our investment in Ethernet switches," said Pat Carr, MIS director at Autoway Newspapers in Campbell Hall, N.Y. "We have roughly 50 of the IBM Ethernet switches, and we also like the idea of being able to grow the switches as demand increases."

IBM also plans 16-port Ethernet and Token Ring switches that will have room for two UFCs instead of one. The new systems will ship in the first half of next year. The above-mentioned UFCs will work with the planned switches.

A sampling of IBM's internetworking plans

NWAYS LAN SWITCH CARDS

PRODUCT	PRICE
8271 10Base-TX UFC	$1,300
[illegible] UFC	$1,000
3-port 10Base-T UFC	$1,700
[illegible] TX UFC	$1,600

NWAYS MANAGEMENT PACKAGES

PRODUCT	PRICE
Campus Manager LAN for AIX	$6,999
Campus Manager ATM for AIX	$5,999
Campus Manager LAN for HP-UX	$6,999
Campus Manager ATM for HP-UX	$5,999

In its effort to drive Asynchronous Transfer Mode (ATM) to the desktop, IBM will extend its TurboWays 25 ATM line of 25M bit/sec. ATM adapters to include models for IBM's Micro Channel Architecture and Sbus-based PCs that use twisted-pair wire and separate units for fiber.

To help users better manage the continually growing IBM internetworking products, IBM also launched a wave of management applications (see chart) that let users manage hubs, switches and routers.

IBM will offer Nways LAN Remote Monitor for AIX and an OpenView HP-UX version for users looking for more detailed performance information. The vendor also will add Integrated Services Digital Network support to its 8235 remote access server, which gives telecommuters a higher bandwidth and often cheaper alternative to asynchronous dial-up links.

Finally, IBM will deliver the Wireless Modem for the Cellular/Cellular Digital Packet Data Landline Connection kit and the Wireless Modem Low-Profile Cable Kit for companies looking to accommodate the needs of mobile workers.

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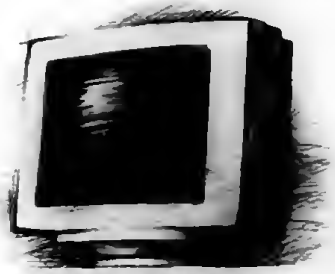
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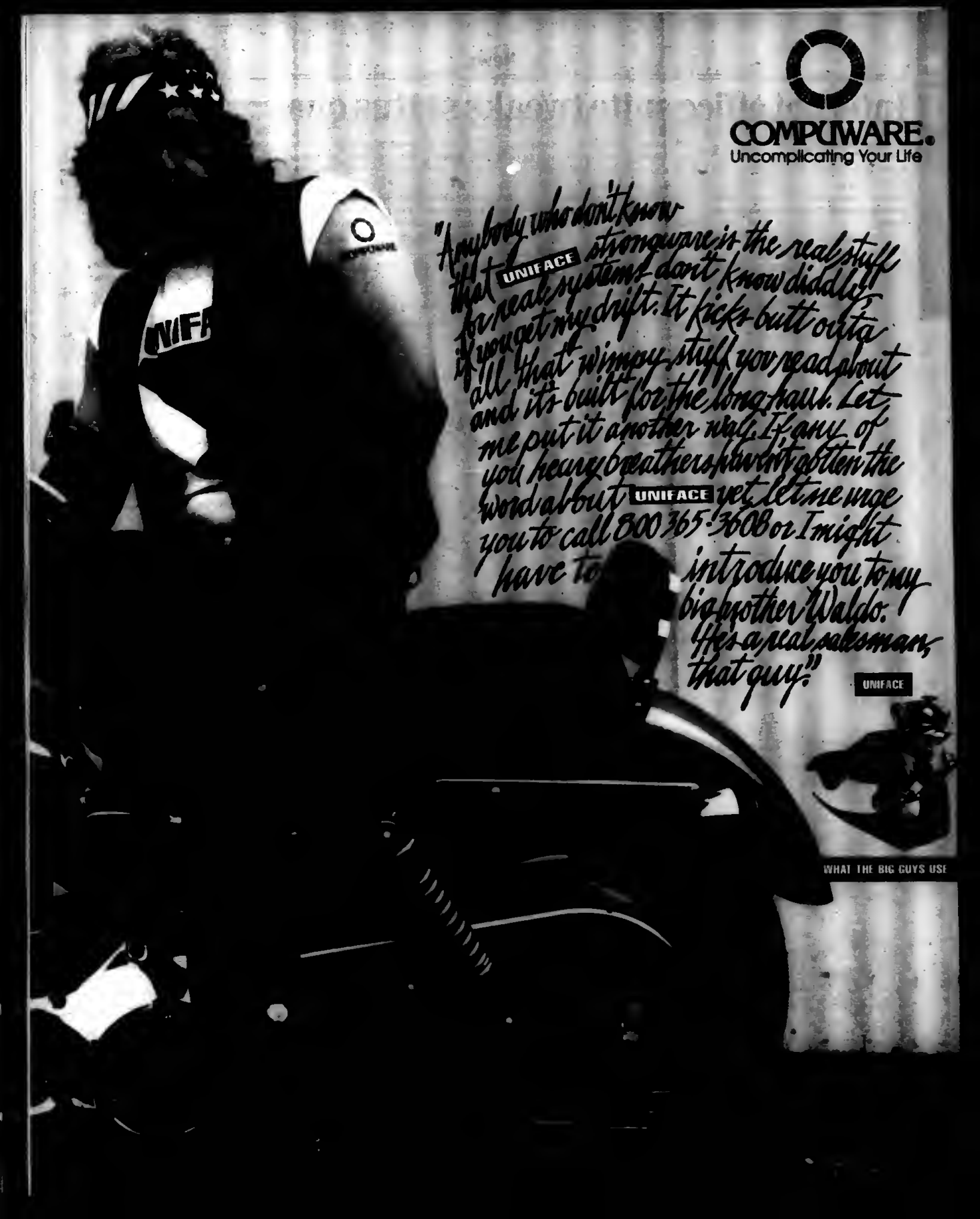


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A few unprovoked remarks about UNIFACE application-building strongware from Reggy "Chainsaw" Morgan, social secretary of Client/Server Angels International, West Covina Chapter.
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UNIFACE
WHAT THE BIG GUYS USE

Internet office suite tweaks status quo

By Cheryl Gerber

An Internet office suite that will enter beta testing this week could foretell the direction that suites — and an emerging desktop operating system — take in the future.

Caldera, Inc. in Orem, Utah, recently unveiled five licensing agreements with Unix software vendors (see box) to port their applications to Network Desktop, Caldera's rendition of the freeware Linux operating system. The software and Network Desktop have been bundled and will be released in December. The package will cost $500.

The Unix-based Linux desktop operating system has already been established at universities. The system went commercial this year, with vendors such as Digital Equipment Corp. legitimizing it as more than just a freeware platform.

Analysts said Linux could take hold of the next generation. "This platform has tremendous potential. This is the first year of college students that graduated knowing Linux," said Mary Hubley, an analyst at Dataprо Information Services Group in Delran, N.J.

Its appeal, however, is limited to technically savvy users. "In the advanced development area and in low-end vertical markets, Linux is the hottest thing going. But I haven't heard a solid support story to encourage a corporate MIS department to take the plunge with Linux," said Philip Johnson, Unix program director at International Data Corp. in Mountain View, Calif.

Support for the Network Desktop bundle can be obtained only through the Internet. The applications in the bundle will contain direct, one-click links to the Internet, said Ransom Love, Caldera's vice president of marketing.

Commercial suite vendors acknowledged that the Caldera bundle illustrates the growing presence of networking in PC software. But they were quick to point out that it will have to address support concerns.

"There's been an evolution in office suites toward greater support for connectivity and open standards. But the cost of support outweighs the cost of software," said Dennis Tevlin, Microsoft Corp.'s group product manager for desktop applications.

"The Linux-based bundle has to mature before it becomes real. 'Mature' means develop, test, stabilize and support [it] so people can run their business on it," said Dave Laferty, director of SmartSuite marketing at Lotus Development Corp. in Cambridge, Mass.

Still, Linux has begun to gather steam commercially. In July, WorkGroup Solutions, Inc. in Aurora, Colo., released its version of Linux for Intel Corp.'s 80386- and I486-based PCs. Linux also runs on a beta version of Intel's P6 microprocessor. And Digital said in March it was developing a low-cost, low-end Alpha workstation to run Linux.

One user said it is only a matter of time before Linux software becomes widespread. "More and more, I hear how programmers want to use Linux at work but can't because their companies want commercial packages," said Greg Bailey, a programmer analyst at American Stores Co. in Salt Lake City. "When there's more commerical software for Linux, both the companies' and the programmers' needs will be met."

Linux lineup

Caldera's Network Desktop suite includes the following Linux applications:

- Novell, Inc.'s WordPerfect for Linux
- NCD Software's Z-Mail electronic mail
- Xess Corp.'s Nexs spreadsheet with links to Lotus 1-2-3
- Metro Link's Executive Motif libraries
- Globetrotter Software's Flexlm license manager
- Caldera's Network Desktop version of Linux

Adobe adds 'net support to its document-exchange program. See page 72.



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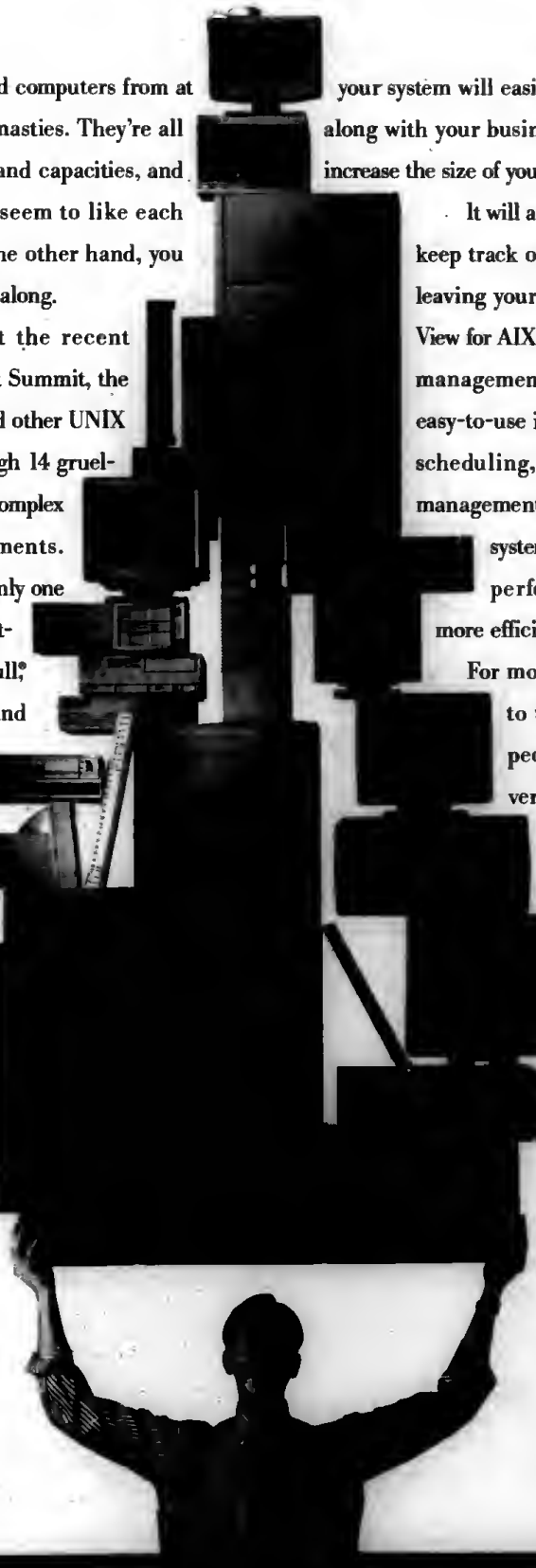
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Mission to control: Smile

NASA turns to videoconferencing to aid shuttle communications

By Tim Ouellette

Videoconferencing has hit new heights, literally.

Last week, the space shuttle Columbia took off on its latest mission armed with a group videoconferencing system that will provide astronauts with a view of the people they speak to back on Earth.

Group videoconferencing lets several users, usually in a conference room-type setup, conduct meetings with people at other sites with the help of cameras and digital video compression.

Previously, the crew of the orbiting shuttle sent back pictures and spoke with mission control but received only audio responses. Now the crew will be able to see the scientists who are reviewing ongoing tests or updating new procedures, for example, or have face-to-face visits with their families.

Visual aid

One of the main goals of the videoconferencing system was to improve the way scientific experiments are conducted. "We needed better onboard help to the missions lab," said Dave Scott, an engineer at NASA's Mission Operations Laboratory at Marshal Space Flight Center in Huntsville, Ala.

Using only the radio connection, mission control would often have to describe complicated changes and equipment without visual aid, similar to the scene in the movie *Apollo 13* in which mission control describes how to make an air filter work with duct tape.

"We have always had problems with taking something and painting a picture with words and bringing that up to the astronauts," Scott said.

NASA developed a 12-pound box for the shuttle that contains an I486 motherboard, a communications card, a PictureTel Corp. System 1000 compression/decompression board and a conversion card. The PictureTel software was tweaked to boot up automatically when a videoconference from mission control is initiated. It was hooked into the NASA-provided audio and camera systems already on the shuttle.

"We didn't want to add one more keyboard or complicated controls," Scott said.

Communications from the shuttle to mission control are handled via analog video or the shuttle's digital video system.

Two-way videoconferencing with PictureTel on the same channel could have been accomplished, but that would have taken up too much bandwidth on the communication link that is needed for other shuttle communications.



Videoconferencing systems *such as the one on the space shuttle Columbia can improve Earth-to-orbit communication*

Access database users braced for 32-bit move

Migration to Windows 95 version a tough upgrade

By Cheryl Gerber

While some beta testers and users of Microsoft Corp.'s Access database say the Windows 95 version will beget an awkward migration from its 16-bit predecessor, others say the technological gain may ultimately outweigh any pain.

The migration pain stems from the fact that Access 7.0, the Windows 95 version, is the only application in the Office 95 suite with a different programming language. Microsoft swapped out the Access basic language in Access 2.0 in favor of Visual Basic for Applications in Access 7.0, which is still in beta testing.

On top of the language change, Access users migrating to Access 7.0 will be moving from a 16-bit to a 32-bit operating environment. Migrating users will be able to exchange only Access 2.0 files — not Access 7.0 files — in mixed Windows 3.x and Windows 95 environments.

Deja vu

This isn't the first time Access users have encountered migration difficulties. "The fact that users have to maintain two versions because of the file format change from 2.0 to Access 95 has existed before," said Leslie James, Access product manager. "When we had a file format change from Access 1.0 to Access 2.0, it ultimately resulted in a positive transition for our customers."

Microsoft has given users three options — Convert, Enable and Coexist (see chart) — for making the transition from Access 2.0 to Access 7.0. But some users don't think it is enough.

"Basically, you can't upgrade to the new version without moving all your users to Windows 95 or NT," said an information systems manager at a major U.S. bank who requested anonymity. "So we're not going to Access 95 or even Windows 95. Instead we'll wait and go to NT Workstation in a year."

Also planning to skip Access 7.0 is Montrose Memorial Hospital in Montrose, Colo. The hospital will likely move directly from the 16-bit Access 2.0 environment to SQL Server on NT, said Bill McClelland, director of IS. It will then decide on a new database front end.

Take three

Three options for the migration from Access 2.0 to Access 95

1. **Convert** – When opening the Access 2.0 application in Access 95, choose the "convert" option to change the data permanently from Access 2.0 format to Access 95 format
2. **Enable** – When opening the Access 2.0 application in Access 95, choose the "enable" option to make changes to data in Access 95
3. **Coexist** – When working with forms, reports or queries, Access 2.0 and Access 95 can share data

McClelland said Access users should split the migration into two parts.

First, to deal with the language change, he has begun building database applications in Microsoft's 16-bit Visual Basic language.

Next, when the hospital moves to a 32-bit Visual Basic environment, he will deal with the operating system change. "Since I have to live in a 16-bit world now, I'm not going to write to a 32-bit environment," he said.

More computer-savvy managers tend to tread cautiously with technology investments to avoid the high cost of maintaining disparate environments.

"If you've made a corporate investment in an Access 2.0 application, you've got to stay with it and not move to Access 95 [7.0] until you are sure an Access 95 application won't be used by a Windows 3.x user," said Chris Le Tocq, principal analyst at SoftTracks Software Research in Los Altos, Calif.

Strange sensation

Le Tocq and others said the Access transition is more typical of moving to a new development environment than upgrading an existing productivity application.

"If you have an investment in Access 2.0 applications, this will cost you money to keep current. It's beyond the normal upgrade cost," he said.

The cost of development resources, management and application testing in a new environment could make life tough for large corporations converting Access applications.

Yet one beta user said he thinks the gain will outweigh the pain. "It's an all-or-nothing upgrade," said Mark Pearson, an information specialist at Enway, Inc., a food processing company in Clackamas, Ore. "As soon as somebody on the LAN creates an Access 95 database, then none of the Access 2.0 people can use it. There's really not much backward compatibility. However, there are enough good, new features to make the upgrade worthwhile."

A final-release beta tester agreed that the migration won't be that painful. "My 'Release Candidate' beta version is almost ready for prime time," said Cary Prague, president of Cary Prague Books and Software in South Windsor, Conn. "It's easy to use Access 95 with other Office 95 applications. The links are significantly enhanced and easier to use."

Microsoft has added ease of use and relational database capabilities in Access 7.0, James said. For example, the Simple Query and Database wizards lead users step-by-step through the process of creating tables, queries, forms and reports. The Wizards fill in the data automatically.

Rain check

Users who bought the Professional version of the Office 95 Suite when it was released Aug. 24 got a coupon to receive Access when it ships next month.

Virus dangers lurk for Windows 95 users. See page 49.

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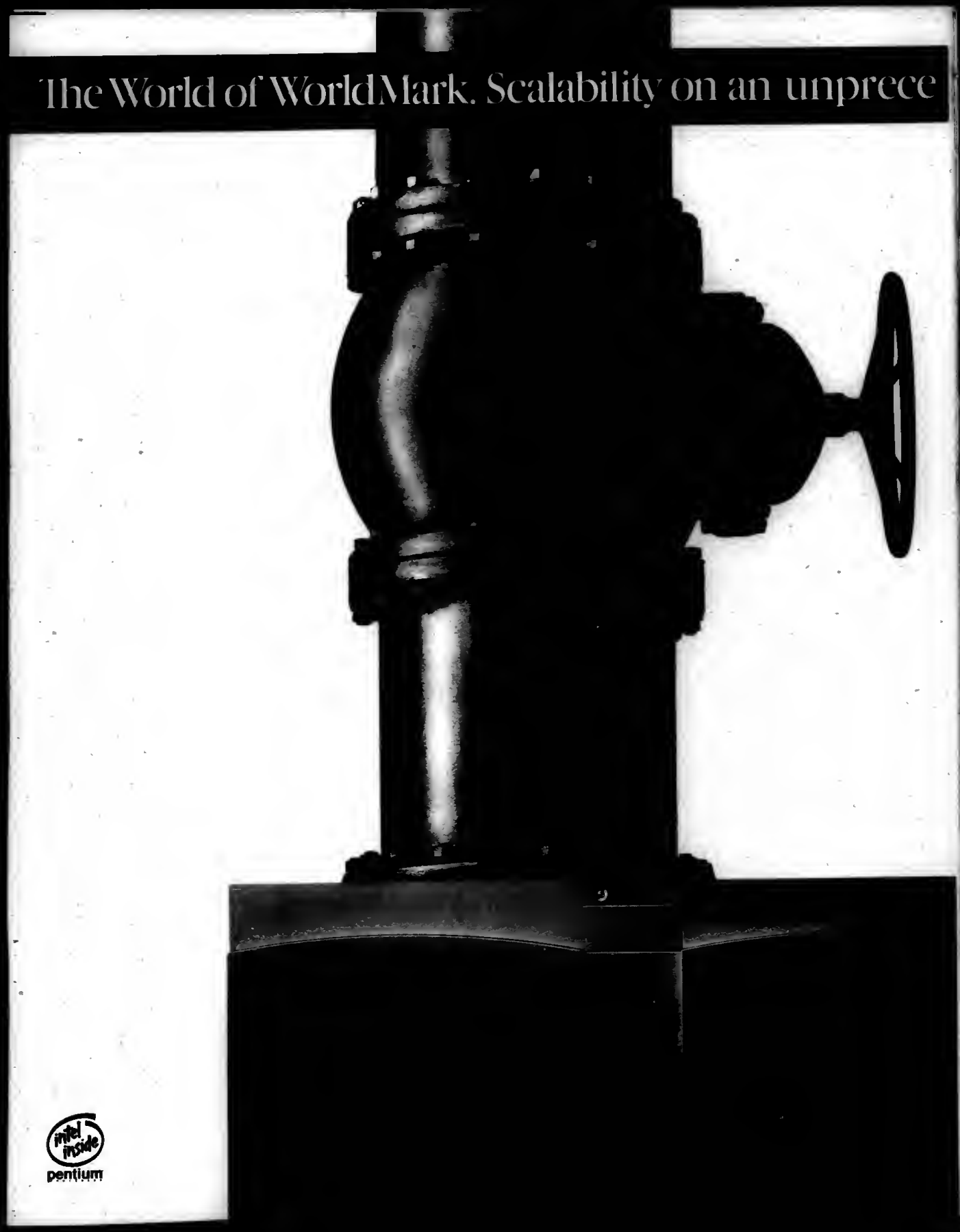
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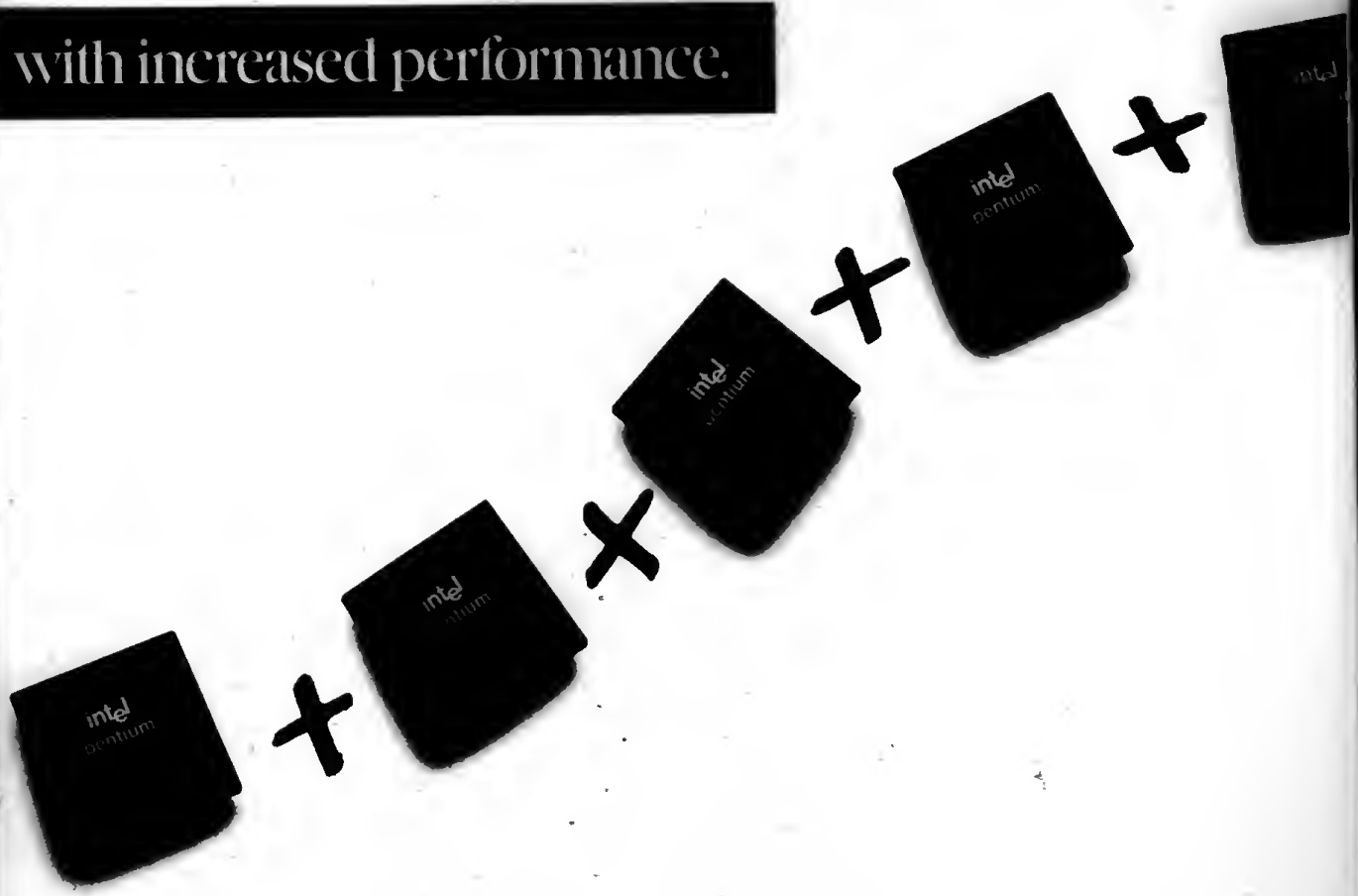
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- Diagnostic subsystem

AT&T WorldMark 5100S SMP Configuration

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- One processor subsystem per 5100S cabinet
- Upgradable to next generation Intel processor family (P6)
- 4 MB second-level cache per processor
- 32 MB Limited Address Range Cache per processor board
- 64 MB-4 GB ECC type memory per processor subsystem
- Up to 160 GB internal disk storage
- 16 I/O slots 32-bit bus width per slot
- Up to 7 LAN and 24 WAN connections
- Internal uninterruptible power
- Hot pluggable disk drives and fans
- Redundant power supplies
- Optional redundant battery backup
- Optional AT&T LifeKeeper Switchover FRS
- Fully upgradable to a 5100C (Cluster) or 5100M (MPP) configuration

AT&T WorldMark 5100C Cluster Configuration

- Clustering of 2 to 8 processor subsystems
- 1 or 2 processor subsystems per 5100C cabinet
- 4 to 32 90MHz or 133MHz Intel Pentium processors per processor subsystem
- Upgradable to next generation Intel processor family (P6)
- 4 MB second-level cache per processor
- 32 MB Limited Address Range Cache per processor board
- 64 MB-4 GB ECC memory per processor subsystem
- 16 I/O slots per node; 32-bit bus width per slot
- Up to 7 LAN and 24 WAN connections per processor subsystem
- Internal uninterruptible power
- Hot pluggable disk drives and fans
- Redundant power supplies
- Optional redundant battery backup
- Automatic system recovery and automatic user and application switchover
- Administration Workstation Subsystem (AWS) allows a single operation view of the entire system

AT&T WorldMark 5100M MPP Configuration

- Scalable BYNET fiber-based interconnect
- 1 or 2 processor subsystems per 5100M cabinet
- 4 to 32 133MHz Intel Pentium processors per processor subsystem
- Upgradable to next generation Intel processor family (P6)
- 4 MB second-level cache per processor
- 32 MB Limited Address Range Cache per processor board
- 64 MB-4 GB ECC memory per processor subsystem
- 16 I/O slots per processor subsystem; 32-bit bus width per slot
- Up to 7 LAN and 24 WAN connections per processor subsystem
- Internal uninterruptible power
- Hot pluggable disk drives and fans
- Redundant power supplies and battery backup
- Administration Workstation Subsystem (AWS) allows a single operation view of the entire system

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Computer Industry

Group assails federal security proposals

ITI says report ignores role of private sector

By Gary H. Anthes
WASHINGTON

The federal government is attempting to impose the use of certain encryption techniques while barring the export of others "against strong objection by the private sector," an industry group contends.

The Information Technology Industry Council (ITI) recently took strong exception to draft proposals for a federal role in information security. The council claims the panel's recommendations "ignore the private sector and focus on how the government can play a large and provocative role in making security products available."

The ITI, formerly the Computer and Business Equipment Manufacturers Association, comprises many of the largest computer and communications firms, such as AT&T Corp., IBM, Digital Equipment Corp. and Electronic Data Systems Corp. A spokeswoman for the ITI said members didn't want to be quoted individually on the government report.

The group sent its complaints to the White House-sponsored Interagency Information Infrastructure Task Force, which published the draft report, "National Information Infrastructure: The Federal Role," last June (CW, June 12).

Where to go

The government report "National Information Infrastructure: The Federal Role" can be obtained on the Internet at http://itf.doc.gov/. Click on "Documents."

Cautious approach

A White House official, who asked not to be named, said he was aware of some industry concerns about the report. "We have been hearing the criticisms and are trying to step up to the responsibility the government has in information security," he said. "And yet we want to be careful to make sure ... we are not stepping into areas that industry can do better."

Some earlier critics of the report said it didn't go far enough in addressing national security threats.

In a letter to the White House Office of Management and Budget, Paul Strassmann, a professor at the National Defense University here, said, "Considering the threats to the security of the U.S. from information warfare and information terrorism, the ... report does not offer useful guidance for the federal government."

IBM rolls out enhanced security for mainframes and networks. See page 92.

Spin-off thrives in low profile

TSS provides PC services without adding competition

By Jaikumar Vijayan

It may be one of the fastest-growing companies in the multivendor PC and network services business, but Technology Service Solutions (TSS) tries its hardest to remain invisible to end users.

And for good reason. Last year, the Wayne, Pa.-based company achieved estimated revenue of $800 million mainly by functioning as a behind-the-scenes provider of customized, private-label PC services for a raft of manufacturers, distributors, integrators and even rival third-party service organizations.

Formed in 1993 as a spin-off from IBM, TSS is a joint venture of IBM and Eastman Kodak Co.

The key to its success is simple. TSS doesn't compete with its customers. Although other organizations, such as Bell Atlantic, offer PC vendors the same kinds of services, they also compete for service dollars with the same vendors by selling directly to end users.

"We go to a lot of pains to make people understand that we are a service wholesaler and that we don't compete with any of the people we provide service for," said Al Andrus, senior vice president of strategy and business development at TSS.

"It is an extremely unique and potentially very successful business model. TSS doesn't sell into end-user accounts; they just end up there on behalf of somebody else," said Eric Rocco, an industry analyst at Dataquest, Inc. in Framingham, Mass.

By allowing vendors to package and sell TSS services as their own, "the company fulfills the need for a service organization that a lot of the major PC companies don't have right now," he said.

That strategy is already paying off for the 2-year-old company, analysts said. Though nearly 90% of its revenue comes from servicing IBM customers, TSS also supports thousands of PCs and network installations representing nearly every major brand and vendor in the market (see chart).

Technology Service Solutions

Established: 1993 as a joint venture of IBM and Eastman Kodak

Mission: To provide multivendor PC and network support services to vendors, distributors, integrators, dealers and others

Sample services: Help desk operations, networking, hardware maintenance, installations, asset management and training

Sample customers: Gateway 2000, NEC Technologies, Data General, Bay Networks, Cisco, Ingram Micro and Office Depot

Employees: Approximately 6,200

The company employs more than 6,000 full- and part-time service technicians and has a major call center in Memphis, where it coordinates a wide range of multivendor PC support activities. These activities include help desk operations, networking, software maintenance and support, hardware installations and upgrades, asset management and training.

A network service center in Dallas handles support issues relating to a range of network environments, including Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT.

Night moves

TSS' recent service offerings include an overnight mobile PC repair service, under which the company guarantees overnight repair and delivery of mobile PCs anywhere in the country.

A fleet of more than 1,600 service vans and over 145 major stocking locations nationwide ensure that "we have 95% or better availability of parts on first calls for most parts," Andrus said.

A lot of its future success, however, will hinge on how successful the company is in distancing itself from its IBM roots, analysts said. PC makers, especially leaders such as Compaq Computer Corp. and Apple Computer, Inc., have been reluctant in the past to hire rivals to service their customers for fear of having them poached.

"It is this fear that TSS is hoping to get around with their business model," Rocco said. Because "however independent they are, the fact is they are still an IBM subsidiary."

IBM fleshes out its new group of server offerings. See page 49.

Briefs

Vendors merge

Rogue Wave Software, Inc., a leader in C++ class libraries in Corvallis, Ore., announced it has merged with **Immark Development Corp.** in Mountain View, Calif., maker of graphical user interface development tools. The new firm will be known as Rogue Wave.

PC sales skyrocket

Global PC shipments are expected to break the 100-million-unit mark in 1999, according to analysts at Dataquest, Inc.'s Asia-Pacific Conference in Taipei, Taiwan, last week. Worldwide shipments, which were 48 million last year, are expected to approach 60 million this year. The U.S. led the market last year with 38% of PCs shipped. Dataquest predicts the U.S. market will grow more slowly this year than the world average, mainly due to a fall in corporate profits and a potential slowdown in the growth of the home market.

SPC consolidates

Software Publishing Corp. (SPC) in Santa Clara, Calif., developer of Harvard Graphics, recently reported that it plans to consolidate worldwide operations. The company reported that it will reduce its worldwide workforce by approximately 90 people, or 45%, over the next two months and will take a fourth-quarter charge of approximately $5.9 million.

AT&T Capital sale mulled

AT&T Capital Corp.'s board met recently to consider AT&T Corp.'s plan to sell its remaining 86% ownership interest in AT&T Capital by the end of 1996. AT&T Capital's board authorized management to take action that meets AT&T's objectives while maximizing value for all shareholders, including a possible public or private sale of the company.







Its prudent, value-minded side.

They're Powerful, Reliable,

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Its plug and playful look.



Its serious, ...chworking, upgrade look.



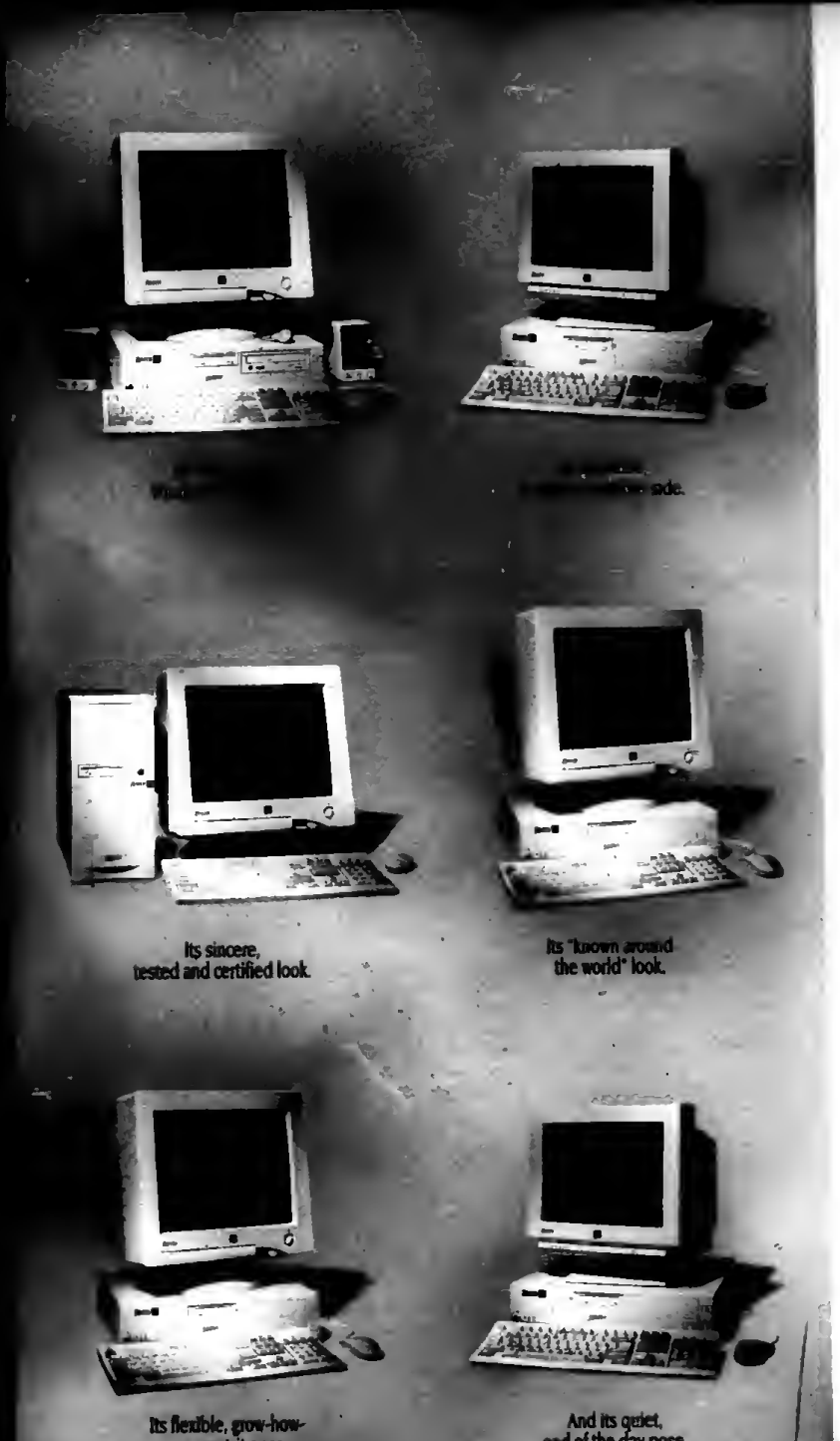
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Viewpoint

Objection

Microsoft's break with the Object Management Group (OMG) ensures that we headline writers will have plenty of good material in the coming year. Unfortunately, it puts you, the user, in the unenviable position of having to choose sides in yet another standards battle.

No one should have been surprised at our report last week that Microsoft will shun the OMG's Common Object Request Broker Architecture (CORBA) and forge ahead with its OLE architecture as an enterprise standard. OLE is crucial to Microsoft's enterprise strategy. Unfortunately, it runs only on Microsoft platforms. The vendor's recent flirtations with OMG's standard for object interoperability tantalized users with the prospect that for once Microsoft would embrace a standard developed by its competitors.



No chance. Never mind that Microsoft's priorities rarely extend beyond the bounds of its own campus. The company does have a legitimate shot at making OLE a de facto industry standard. It's already the clear winner on the desktop — the Patricia Seybold Group estimates 35 million PCs run it. And there will be no shortage of third-party vendors willing to try implementing OLE on Unix, MVS, OS/400, toaster ovens and anything else that plugs into the wall.

What's unfortunate is that the standoff will damage a lot of good work already done by the OMG, which is one of the few vendor consortia that really works. CORBA is a good model for object integration on servers, and the OMG is studying proposals to link CORBA to OLE, offering users the prospect that a single standard for enterprise object integration could be hammered out by early next year.

But no. With Microsoft going it alone in the enterprise, a lot of brainpower in the market will be siphoned off from CORBA into OLE. A standards battle is inevitable, and no single winner is likely to emerge. Wouldn't it be nice if just once Microsoft backed off from a battle it could win in the name of letting customers just get on with things?



Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*



Mac OS bests Win 95 for graphics ...

"Win 95 graphics make strides" [CW, Sept. 25] makes several statements about the Mac OS that aren't true.

The statement that "the ability to multithread is in Microsoft's Windows 95 but not yet in the Macintosh" is incorrect. Since 1993, the Mac OS has had a Thread Manager application programming interface that allows developers to utilize threads in their applications. Apple and DayStar Digital announced in May a task library that allows threads to be off-loaded to other processors on multiprocessing systems and regularly threaded on uniprocessor Macintosh systems.

Second, a user is quoted as saying, "As Windows NT becomes more popular, the overall market share of the Macintosh will probably shrink." Demonstrations have shown that a Power Macintosh with a 120-MHz 604 chip is twice as fast as a Dell dual 90-MHz Pentium running Adobe's Photoshop for Windows NT.

Other Mac OS advantages for doing graphics include multiple monitor support and a stable history of advanced technologies, such as ColorSync color matching and 24-bit color support.

William Abrams
Software developer
Center for Telemedicine
University of Oklahoma Health Sciences Center
willie-abrams@uokhsc.edu

... and offers most transparent net links

Your comparison of Win 95 and the Mac OS [CW, Sept. 25] sang the praises of Win 95 but didn't have any rebuttal for the Macintosh.

Since when did Win 95's cooperative multitasking become better than the Macintosh's cooperative multitasking? And I thought Apple's Thread Manager implemented multithreading.

You state that Win 95 multithreading lets you apply the same control across 100 photos, while the task on a Macintosh is sequential. Last I heard, CPUs could handle only one instruction at a time. And macro packages for Photoshop on the Macintosh do the same task.

The caption says Win 95 makes 3-D graphics a reality. Where did Apple's QuickDraw 3D go? And leading graphics vendors such as Industrial Light and Magic and Disney's Imagineering Labs offer 3-D graphics.

Pages later you tell me that Apple's networking is considered nonexistent. I can connect a PowerBook to our LAN in two seconds, while the guy with the Gateway laptop must sit on the floor with a parallel cable.

The Macintosh has the closest thing to transparent connectivity available — when connecting to any network.

William Cox
Greenwich, Conn.
cwcjr@eworld.com

No leader there

Scott Bates is obviously confused about authority, which is given with leadership ability and is developed through years of training and experience ["Sound Off" CW, Sept. 25].

To blame people's resistance to change and new technologies on IS professionals is ludicrous.

The business managers in Bates' example didn't lead their sales staff into using technology — they merely had the power to threaten staff members' paychecks.

Bates talks about leading by example; but if his attitude toward technology is that it consists of "toys," how does he expect his staff to take technology seriously? It sounds like Bates is the one who lacks real vision for his business.

Kay Meyer
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More letters, *page 42*

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

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James Martin

Turn your company into a cybercorp. It's wired. It's virtual. It's agile.

Are you ready for the fast-paced world of the "cybercorp" and electronic commerce that mocks national borders? That is the future painted by James Martin, the renowned lecturer, consultant and author of the forthcoming books The Great Transition *and* Cybercorp. *In a recent telephone interview with senior editor Mitch Betts, Martin spoke from his castle in Ireland about cyberspace and the role of corporate information systems departments.*

Q: What is a cybercorp?

A: It is a corporation designed for cyberspace. It is rather like an animal in a jungle, stalking its prey. It has to be constantly alert. At the same time, it is being stalked. So the cybercorp has to be designed for real time, with electronic sensors and the ability to quickly respond to changing events worldwide.

It needs different software from the software that is common today. And it needs a lot of management and decision-making assistance. The cybercorp is likely to be virtual — virtual operations, virtual offices and so on.

The world of the cybercorp is going to be a world of virtual relationships. There will be some companies that are little more than a nerve center of a mass of virtual relationships. Sometimes a virtual corporation like that can move extremely fast (see story at bottom right).

Q: What will be the role of the cybercorp's IS department?

A: The IS department becomes more important because the whole corporation revolves around the networks.

One anticybercorp thing that has happened in the past 10 years is random downsizing, where everyone does their own thing on the PC and there is no architecture. One of the characteristics of a cybercorp is that it needs an architecture of integrated networks. The cybercorp will have masses of servers, many of them unmanned, and will need data warehousing, data mining and very powerful, open links to the computers of its trading partners.

One of the characteristics of the cybercorp is that it's likely to change its structure incredibly fast. That means if it takes you three years to develop a Cobol system, you're dead.

So the IS department will have to build systems that help in business re-engineering extremely fast, and you can't do that with Cobol.

So Cobol needs to be replaced with object technology, templates, highly flexible packages — software like Amdahl's Huron, which is rule-based, so you can change the rules and change the behavior overnight.

Q: Will the coming of the cybercorp help IS departments get more respect from CEOs?

A: It's very unfortunate, but what we've got today is a business culture that is anti-IS and anti-IS people, whereas the IS professionals are becoming more and more entangled in their own technology and less and less interested in business. So we've got a split between two cultures. The only way you can build a successful cybercorp is to pull those two cultures together so they work extremely well together.

The best way to eliminate the two cultures is to have a group in the middle that consists of people — "enterprise engineers"— who understand the technology and at the same time understand the business very well.

Q: Will we see more IS outsourcing in the virtual corporation?



Prolific author James Martin, *from his castle in Ireland, discusses the future of IS, electronic commerce and the politics of cyberspace*

A: We're going to see more outsourcing, not only in IS but in everything else. Every corporation that's really thinking "cybercorp" has to think, "What should we do ourselves, and what should somebody else do?" Anything you're very, very good at you'll want to do yourself, and anything that somebody else can do better, it's better to outsource it. So we may have lots of virtual relationships.

If a corporation hasn't got skill in object-oriented development and it needs to get some new systems custom-built, then it makes sense to outsource that job.

Q: You're a big fan of electronic commerce, but what are the political implications of borderless transactions?

A: 'net-order firms, as opposed to mail-order firms, will become very popular and grow very fast. For example, here [in Ireland], if I buy a software package or a music CD, I have to pay a large value-added tax on it. However, if I buy it over the 'net, there is no value-added tax. So consumers can automatically bypass national taxes of that type.

We're seeing a new phenomenon that will worry politicians — the separation of economy and state. Large segments of the economy are going to be independent of national laws. That's something that hasn't happened before. Politicians can pass national laws, even though it takes a long time to do it, but nobody at the moment is capable of passing worldwide laws. Can you imagine how the same law would apply to China, the Cayman Islands and the U.S.?

JAMES MARTIN on ...

Electronic commerce and digital cash

They're going to take off incredibly fast. In the next 12 months, we'll see people putting their toes into the water, beginning to use digital cash, being cautious about it. Once the software becomes common and the technology becomes trusted, it's going to explode. It's going to be as big as E-mail.

Security and privacy

Twenty years from now people will look back and be amazed at the way we use credit cards because there's no serious attempt to build security into credit-card transactions today. E-cash is much more secure than credit cards. 'net-order firms could keep details of who bought what and sell the details, just as mail-order firms do. It may be that consumers will ask to do business with 'net-order firms that guarantee to protect their privacy.

An unorthodox, but highly profitable, cybercorp

There is a company to Finland that has been around for centuries. It had been in forest products. Then in the 1980s, it diversified into television manufacturing and never made a profit. It diversified into PCs and sold its PCs division. Its CEO committed suicide, and then a young CEO who had been at MIT took over at age 38 and [decided] to get into digital cellular technology, even though the company didn't know much about that.

He outsourced the design; he outsourced the marketing; he outsourced the chip fabrication; he outsourced just about everything. Astonishingly, this company became one of the world's largest telephone companies in about 18 months or so and became extremely profitable.

That's Nokia, the second best-selling cellular phone in the world. AT&T and the telephone giants in Europe had spent hundreds of millions of dollars on cellular technology research and yet Nokia beat them, very fast indeed.

So, this is an example of a virtual corporation having the capability to grow astonishingly fast. — *James Martin*

Time to increase IS staff, not outsource

I'd like to say a word about Paul Strassmann's article "Outsourcing: A game for losers" [CW, Aug. 21] — good.

I am a 42-year-old Novell Certified NetWare Engineer who used to be a system engineer. I watched as my company was "workforce reduced" from 60,400 employees in 1986 to 12,000 when I left ih 1990. At times, I find it overwhelmingly difficult to reconcile my education in physics and experience as an engineer with those who use politically correct methods to adjust the bottom line.

I will go home tonight, eat supper, maybe walk down to the river and hank fish for a while, watch some geese fly by and find reassurance in the beauty of God's creation hy watching the sun set as I sit, lean hack on a hig cottonwood tree and chew on a weed.

I also look forward to Mr. Strassmann's next article.

Tom Demaree
Fridley, Minn.

Having worked in an IS department and having been a "downsizee," I also say that such companies should increase their IS staff for the following reasons:

- Compnters and LANs are becoming more and more the nervous system for factories and companies. Constraining them only demands manual effort.
- Effective competition demands more effective use ef an organization's staff rather than the continuation of antiquated, manual efforts.

I was really glad to see someone of Strassmann's stature offer his opinions. Where the rubber meets the road, I believe his conclnsions are already evident and felt. Thanks.

Randall C. Bowling
Warner Robins, Ga.

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Real-world 'net use

Clifford Stoll may have used the Internet longer than some of your readers have used computers [CW, Aug. 14], but his comments demonstrate that his experience didn't teach him much about life in the "real world."

He states that "the garage that services Toyotas" doesn't need the Internet. Most auto service organizations have a ton of manuals and catalogs, all out of date, which they would happily dump in favor of one up-to-the-minute connection to the company's central database.

Stoll states that Internet transactions won't replace a human salesperson. But most businesspeople I know purchase much of their equipment via the telephone from people they have never seen.

True, most of the information on the Internet doesn't apply to me. But most magazines and TV ads don't apply to me either. Should a library house only those books that every one of us would want to read?

We have all heard more hype about the superhighway than we would choose. I would rather see someone of Stoll's stature making positive suggestions for real-world uses of the technology.

Nora Miller
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Alternative officing

Thanks for the timely, concise and helpful article on telecommuting for IS staff ["Work@home" CW, Sept. 4]. Your readers also may want to visit the Telecommuting, Teleworking and Alternative Officing Web page at http://www.gilgordon.com.

Gil Gordon
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Telecommuting Review
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74375.1667@compuserve.com

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Ian Nicolson Executive Vice President HVP Divisi
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WIRELESS USERS GET ROOM TO ROAM, 52
NEW PRODUCTS, 57

Desktop Computing

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IBM fleshes out server offerings

By Jaikumar Vijayan

IBM this week will broaden its PC server offerings with two new lines — even as the company last week confirmed that delivery of its high-end PC Server 720, announced in March this year, continues to be delayed.

IBM's latest additions to its PC server family are the PC Server 310, a low-end stand-alone LAN system for small businesses, and the PC Server 520, a dual-processor-capable system that will sit near the top of IBM's server family.

Meanwhile, the PC Server 720 — IBM's top-of-the-line machine, based on six Intel Corp. processors — will not start shipping at least until the end of the month, according to company officials.

Problems with the compatibility of certain adapter cards and device drivers in a symmetrical multiprocessor environment are a major cause for the delay, said Angelica Horaitis, a director at IBM.

"We are talking with all the different device driver and adapter card manufacturers. We are completing our testing, and we will be going to general availability soon," Horaitis said.

Worth the wait?

Some users who have waited for the system since its announcement are prepared to wait longer but cautioned that much more of a delay could push the system behind the curve.

"We have been anticipating them for six months now. We have been on the 'more than interested' list for over a month. By the time they get to market with the 720, it probably is going to be old news," said one user at a large insurance firm in the South, who asked not to be named.

IBM's new servers meanwhile will close some gaps in its current server lines, observers said. The 75-MHz Pentium-based 310 will sit between the lowest-end PC server 300 and the dual-processor-enabled, midrange PC Server 320.

Unlike the 300, which supports only Peripheral Component Interconnect/Extended Industry Standard Architecture (PCI/EISA) technologies, the new 310 will offer PCI/ISA and PCI/Microchannel Architecture (MCA) support (see chart).

With this offering, IBM's low-end Server 300 series extends from an entry-level 75-MHz Pentium-based uniprocessor system to a dual-processor-capable system spanning PCI and MCA and supporting 90-MHz Pentium chips.

Top of the line

The 520 series, meanwhile, will sit just under the PC Server 720 and will represent IBM's high-end PC server offering for the moment. The dual-processor-enabled systems are based on the 100-MHz Pentium and will support PCI/MCA and PCI/EISA environments.

"It is definitely a good move by IBM. There is a big gap right now between the 300 series and the 700 series," said Lloyd Blauen, a Unix/LAN administrator at USAir in Arlington, Va.

The current PC Server 500 supports only MCA and therefore is of no interest to users of EISA such as USAir, Blauen said.

IBM's new PC servers

Product	Processor	Bus support	Hard disk	RAM	Starting price/ Availability
PC Server 310 (Workgroup)	75-MHz Pentium	PCI/Micro-Channel and ISA	16 GB	16M	$3,299/ October

Old viruses licked, but new ones find fodder in Win 95

By Gary H. Anthes

BOSTON

There is good news and bad news about computer viruses for Microsoft Corp.'s Windows 95, experts said at a conference here recently.

The good news is that most of your old familiar viruses — such as Stoned, Form and Monkey — are likely to be detected and removed by existing antivirus products. That is because Windows 95 was specifically designed to run old Windows/DOS applications, so viruses tend to exhibit similar behavior under both operating systems.

Fresh problems

Unfortunately, however, some viruses may behave under Windows 95 in ways unintended by their writers so that a previously "benign" virus could lay waste to your brand-new system.

Compounding that worry is the fact that vendors of antivirus software have had to hit a moving target as Microsoft advanced the operating system along a torturous road from Chicago to beta Windows 95 to production Windows 95. "Antivirus products for Windows 95 are not mature yet," asserted Wes Ames, a senior principal scientist who manages antivirus efforts for 65,000 PCs at The Boeing Co.

Top viruses

Out of some 6,000 known computer viruses, the following six were reported most often during a one-month period. Listed are the viruses and the percentage of all reported occurrences:

- Form: 19%
- Parity Boot: 16%
- NYB: 9%
- AntiEXE: 7%
- Sampo: 5%
- JackRipper: 5%

Source: "Virus Bulletin," Abingdon, Oxfordshire, England.

What to do? Back up your system early and often, run virus scanning software regularly and pay attention when Windows 95 issues this message: "Warning! Your computer may have a virus. The Master Boot Record on your computer has been modified."

While MS-DOS contained a built-in virus scanner, Microsoft omitted it from Windows 95, in part because scanners must be updated constantly to be able to recognize the latest viruses.

The Windows 95 virus warning is useful, but it is no substitute for a scanner, experts said. "The message is not reliable and not accurate," said Shane Coursen, a virus researcher in the Peter Norton Products

Viruses, *page 53*

Delrina's suite covers Win 95 communications

By Cheryl Gerber

■ Beta testers and users last week said Delrina Corp.'s upcoming suite of communications software for Microsoft Corp.'s Windows 95 will provide reliable, inexpensive one-stop shopping when it ships in mid-November.

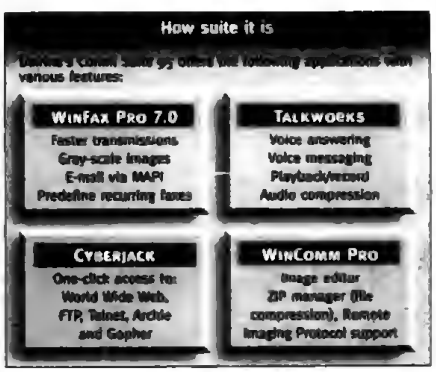
Built from the ground up for Windows 95, Comm Suite 95 includes four applications — one a suite in itself — that target every type of communications user.

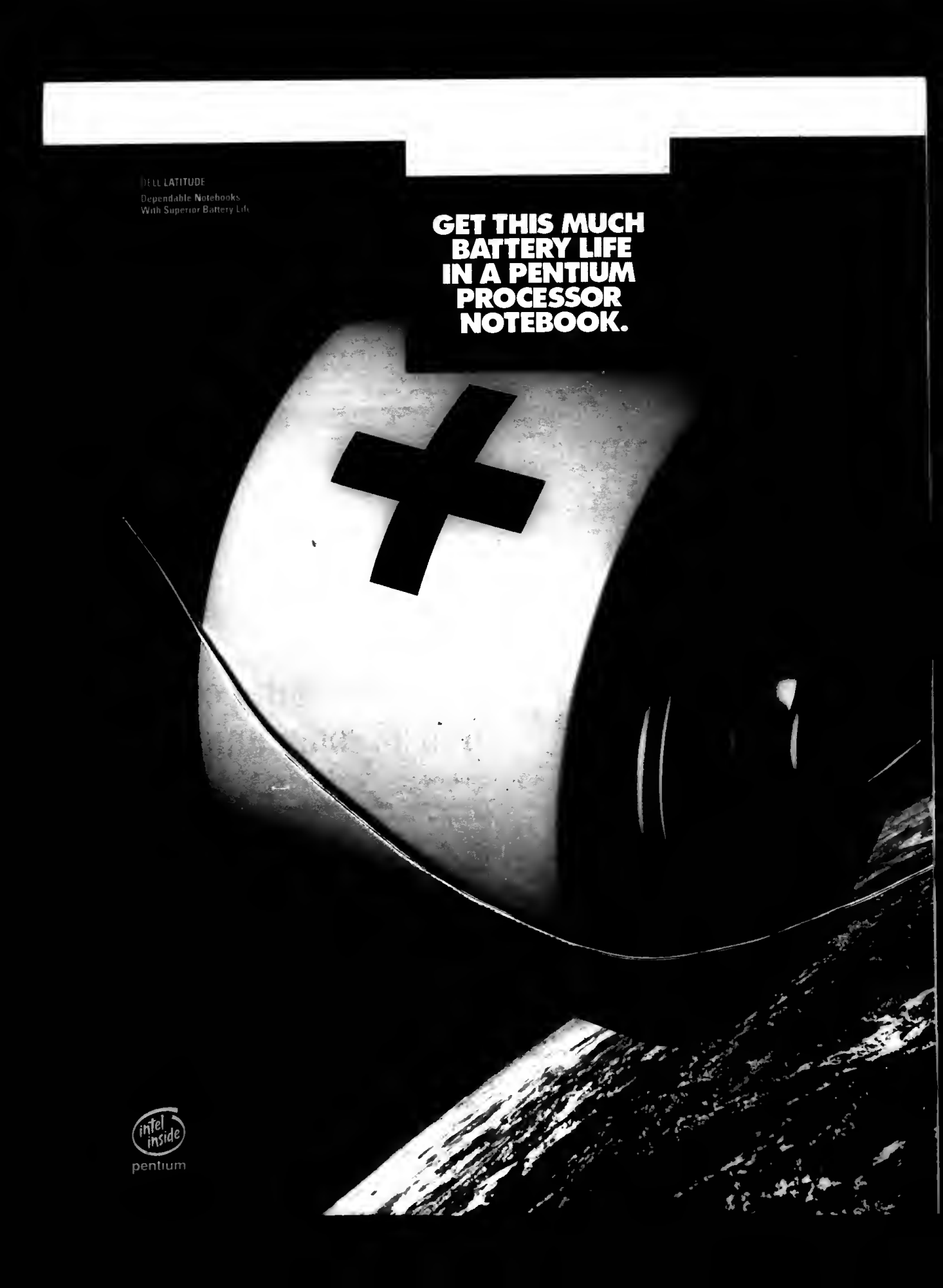
The new version of PC fax software in the suite, WinFax Pro 7.0, is integrated with Talkworks, the suite's computer telephony application. Through this integration and some new electronic-mail capabilities, WinFax Pro 7.0 can distinguish among incoming fax, voice or data calls. However, users need a fax/modem that supports voice to use the voice capability.

One beta user said Delrina has accomplished an integration milestone in Comm Suite 95. "You can be paged when you receive a fax, or if you are smart enough to use the rules-based function, you can set it up so you are paged only when you receive certain kinds of faxes," said Peter Davidson, president of Davidson Consulting in Burbank, Calif.

The suite's data communication piece,

Delrina, *page 53*




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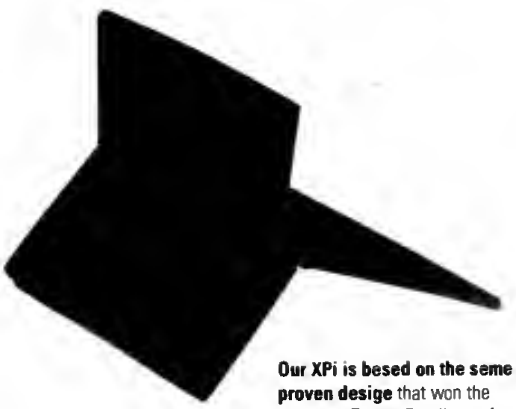
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Designed for Microsoft® Windows®95

Wireless users get room to roam

Mobile IP capability offers continuous connections

By Mindy Blodgett

Imagine sitting in the cafeteria choking down lunch and realizing you forgot to send a memo to the boss. Rather than dash back to your desktop PC, you grab your laptop and transfer the file wirelessly on the spot.

Right now, this is fantasy, but a new integrated mobile IP offering promises to give mobile users continuous connections to the enterprise network.

The capability comes from three companies: Telxon Corp. in Akron, Ohio, which makes portable and wireless communications devices, FTP Software, Inc. in North Andover, Mass., a supplier of TCP/IP software and applications, and Aironet Wireless Communications, Inc. in Fairlawn, Ohio, a wireless LAN supplier. The companies have devised a way to allow mobile, wireless users to roam across multiple segments of TCP/IP networks without disrupting wireless network connections.

The advantages of mobile IP enabled networks and how they will work

- Users will be able to use a wireless-enabled laptop and roam from meeting room to cafeteria while maintaining network connections
- Can be configured to support Ethernet or Token Ring connections

Need is there

At least some users say they need it. Edward Hollingsworth, systems engineer at Union Pacific Railroad in Omaha, said products using a mobile IP standard would give the railroad the advantage of the wider bandwidth of a wireless LAN in conducting rail car inspections and billing across a six-mile radius.

"For instance, the locomotives all have black boxes, like planes, which record events," Hollingsworth said. "We download those by hand. We would like to have wireless connections to update the databases regularly and to download wirelessly."

A user network would have to designate at least one access point as mobile IP-enabled, making it the "home agent." Each mobile user, or node, registers to its home agent access point. When a device roams across a router boundary, it registers to a "foreign agent" access point, always maintaining the connection.

On its way

The Internet Engineering Task Force mobile IP working group is currently working on a standard for mobile users of TCP/IP.

"They've removed a real stumbling block here with this mobile IP," said William Frezza, president of Wireless Computing Associates, Inc. in Yardley, Pa.

In December, Telxon will begin marketing a product that will include FTP Software's DOS or Windows network software drivers, Aironet's wireless LAN access points and Telxon's portable and pen-based computers. FTP also plans to market its mobile IP software separately.

CDPD carriers power up ventures with utilities

Firms hope wireless systems improve efficiency

By Mindy Blodgett

Cellular Digital Packet Data (CDPD) carriers are making significant forays into at least one vertical industry — utilities.

Bell Atlantic Nynex Mobile in Bedminster, N.J., recently announced it has launched the largest CDPD application to date at Public Service Electric & Gas (PSE&G). PSE&G will deploy pen-based computers among 750 field service workers in New Jersey to send and receive repair requests and information over the CDPD network.

Cellular Digital Packet Data

- Transmits data over cellular networks by using idle intervals in the voice channels
- Best for short, bursty transmissions
- Offered by many cellular carriers, including AT&T Wireless, GTE Mobilenet and Bell Atlantic Nynex Mobile, although no nationwide network currently exists

And GTE Mobilenet, Inc. in Atlanta recently announced it has signed up Virginia Natural Gas, Inc. to use CDPD and a computer-aided dispatch system for customer service and repair communications in the Norfolk, Va., area. The utility plans to equip about 75 workers with wirelessly enabled pen-based computers by the end of the year.

CDPD transmits short bursts of data over the cellular network. Originally hailed as the future of wireless communications, CDPD network deployments have been sluggish. The slow pace has some industry observers questioning the technology's viability.

In search of productivity gains

But David Weston, administrator of quality at Virginia Natural Gas, said the company hopes to improve efficiency and productivity by 20% by employing CDPD for wireless communications.

"By eliminating the paperwork, the clerical time, the time spent finding phones, we think the investment will be worth it," Weston said.

Weston said it will cost the utility about $850,000 to implement CDPD, including buying Telxon Corp. pen-based computers, vehicle cradles for the devices, CDPD modems and a new Unix server.

"But we have run some numbers, and we expect to have a payback in about 18 to 24 months," Weston said.

Geoworks' Geos takes flight with new two-way features

By Mindy Blodgett

Mobile devices that support Geoworks' Geos operating system will soon have two-way features such as electronic mail, wireless faxing and access to financial information services such as stock quotes.

These features will be available as a result of agreements with four vendors that Alameda, Calif.-based Geoworks recently announced.

The support will add more value and functionality to such devices as personal digital assistants (PDA) and "smart phones," Geoworks officials said. Smart phones are cellular phones with some added computer functionality, making them a hybrid between a phone and a handheld computer.

Participating companies

The companies announcing software support for Geos include the following: Wynd Communications Corp. in San Luis Obispo, Calif.; Notable Technologies in Bellevue, Wash.; Intuit, Inc. in Menlo Park, Calif.; and Palm Computing, Inc. in Los Altos, Calif.

Industry observers said the agreements will give credibility to the Geos-based handheld devices manufactured by companies such as Nokia Mobile Phones Ltd., Toshiba Corp., Hewlett-Packard Co. and Novell, Inc.

The sagging PDA market has led to calls from analysts and users to add more functionality and connectivity to handhelds to enhance their use as personal organizers.

"It's very important to Geoworks and to these developers that they continue to come up with useful applications," said Michael McGuire, an analyst at Dataquest, Inc. in San Jose, Calif. "This is more evidence that Geos is a very credible platform. And more useful applications can mean more momentum for the platform and for the devices."

In the works

The new applications are likely to be bundled into or offered with new devices on the horizon, Geoworks officials said.

Companies supporting Geoworks' Geos operating system:

Company	Product
Wynd Communications	Two-way wireless service for integrating functions such as E-mail and paging into mobile devices using Geos
Palm Computing	Connectivity of PIM data from the mobile device to the PC
Intuit	A new version of Pocket Quicken for mobile devices to allow users to organize their finances
Notable Technologies	Septor, a customizable financial information service

In support of Geos, Intuit will soon launch a new version of Pocket Quicken that will let users organize their personal and business finances. Wynd Communications will provide a service that offers wireless faxing capabilities as well as E-mail and paging. Palm Computing will offer personal information manager (PIM) software that organizes random data for quick transfer between the device and a PC. And Notable Technologies will release Septor, a customizable financial information program.

55 million and counting

There are currently 55 million cellular phones in use globally. The growth of digital communications products is expected to capitalize on widespread use of cellular technology for wireless data communications.

Delrina

CONTINUED FROM PAGE 49

WinComm Pro 7.0, provides more support for connecting to bulletin board services. The fourth application, Cyberjack 7.0, has Internet applets that a beta tester said make accessing the Internet easy.

Cyberjack contains a bevy of Internet modules under a common interface. One such module is Guidebook, equipped with folders in which users can permanently store all their Internet sites, then launch those sites with one click.

"Cyberjack makes it easy for someone who's just starting out on the Internet and for avid Internet users. It contains all the modules anyone would need," said beta tester Jack Pincus, president of Biotechnology Strategies in Lansing, Mich.

The suite as a whole has been fashioned after Microsoft's Office 95 suite, said Mark DeMazza, president of Mind Computer Consultants in Clinton, Conn., and a beta tester of Comm Suite 95.

DeMazza said that some of the menus in Talkworks do not work properly. But he noted that Delrina is working on the problems. "Delrina takes feedback from beta testers seriously and immediately implements their suggestions," he said.

Market niche

While Delrina's communications suite seems to have broad appeal, initially its target audience could be limited to small businesses, one analyst said. "Those in the [small office/home office] market are finding this a cheaper, more reliable way to get the functionality than buying the components individually," said Michael Bragen, a principal at BMC Research in Lexington, Mass.

But Bragen said large corporations may be slower to adopt such technologies as PC fax or PC voice mail because most large outfits already have fax machines or corporatewide voice mail.

For the first 90 days after it begins shipping, Comm Suite will be priced at $99. After that, the suite will cost $129.

Viruses

CONTINUED FROM PAGE 49

Group of Symantec Corp. in Santa Monica, Calif. "You won't see the message in all cases, even when a boot virus has infected the system."

According to an article in the October issue of "Virus Bulletin," the warning is displayed when the PC is infected with the Form virus, which doesn't attack the master boot record. Worse, the message does not pop up when the master boot record has been modified by the Jumper virus, according to the newsletter.

Install stall

David J. Stang, chief technical officer at Norman Data Defense Systems, Inc. in Fairfax, Va., warned that the presence of antivirus software on a PC may prevent Windows 95 from installing correctly, often in a way that is not apparent. "It won't run right, the machine hangs and Bill Gates gets a phone call," Stang said.

Stang advised users to turn off existing antivirus products before installing Windows. He also said users shouldn't automatically upgrade to the Windows 95 version of antivirus software unless the vendor can clearly demonstrate its superiority over the MS-DOS version.

Experts said, so far, there have been no reports of viruses written specifically for Windows 95. "But I'm sure there are those doing it," said Richard Ford, research director at the National Computer Security Association in Carlisle, Pa. "It will be seen as a cool thing to write the first Windows 95 virus. But it's a lot harder job than under DOS."

Windows 95 keeps a copy of the master boot record and issues a warning during boot-up if it has changed since the last boot. When the virus warning is issued, the user may request additional information or simply proceed. According to Coursen, the information displayed is useful to a virus expert, but most users will probably want to call technical support when they get the warning message.

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EXIDE ELECTRONICS

Digital gives NT desktops a boost

By Michael Goldberg

Digital Equipment Corp. recently unveiled workstations that run Microsoft Corp.'s Windows NT — with an Alpha processor daughter card that users can plug in for a power boost.

Digital is calling its Intel Corp.-based Celebris XL and Alpha XL desktop systems "personal workstations." The machines are targeted at mechanical engineers and software developers. Applications tailored for the financial and publishing industries will follow in the next year, expanding the role of the new boxes, Digital officials said.

Digital PC and workstation users familiar with the machines praised the processing flexibility of the plug-in processor daughter card, which is a technology the Maynard, Mass.-based company has talked about for a couple of years.

"One of the reasons we chose Digital [in 1993] was the scalability they offered. We need the upgrade or scalability in the processing power ... without reinvesting in new equipment," said Len Monteleone, vice president of Tullett & Tokyo Forex, Inc. in New York.

At peak market times, Monteleone said, his foreign exchange brokerage can hit a processing wall with its Pentium-based PCs. He wants to upgrade some of his 100 Pentium models to Alpha microprocessors early next year.

"This opens up the market for Digital to sell Alpha-based systems to customers other than their installed base," said Jon Oltsik, an analyst at Forrester Research, Inc. in Cambridge, Mass. "From a market perspective, it makes one box capable of what two boxes [do] now in an engineering environment."

Wonder workstations

Digital officials said the company expects to sell all "personal workstations" through resellers and distributors. The machines, which run on Windows NT, come in these models:

Celebris XL 5100	100-MHz Pentium	$5,387
Celebris XL 5133	133-MHz Pentium	$6,047
Alpha XL 266	266-MHz Alpha	$6,824

Replacing an Intel processor with an Alpha-based daughter card "is going to be like creating a whole new machine, and it gives it a whole new life without having to buy new memory or anything," said Gary Davis, president of Animation House, an Evansville, Ind.-based special effects production center. Animation House uses Digital AXP workstations and Apple Computer, Inc. Macintosh Series 604 desktop systems.

Analysts noted that Digital is offering the processing power of its Alpha chips and a RISC architecture to users who are picking up Windows NT. Leading workstation vendors such as Hewlett-Packard Co. and Sun Microsystems, Inc. offer RISC-based systems on Unix. IBM's PowerPC series runs OS/2, AIX Unix or Windows NT on its PowerPC chips, but Intel versions require that users purchase a different system.

Andrew Feit, an analyst at Dataquest, Inc. in San Jose, Calif., said, "If you're not satisfied with your Pentium speed, in the past, you had to buy a $20,000 workstation on Unix. Now, for a couple of hundred dollars more, you can stay with the Windows environment and get the performance you're looking for."

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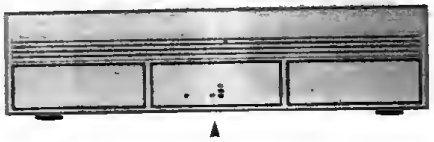
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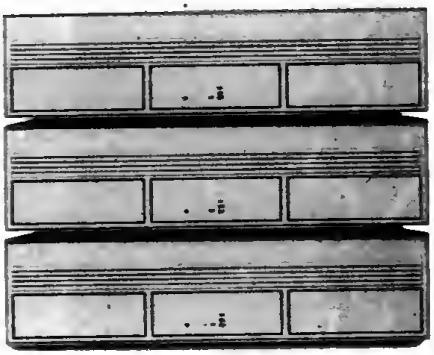
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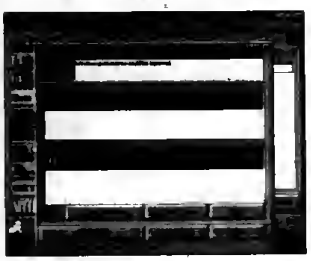
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CyberMedia, Inc. has introduced First Aid 95.

According to the Los Angeles company, First Aid 95 is a software product that automatically fixes more than 10,000 Microsoft Corp. Windows 95 and Windows 3.1 software configuration problems. It



CyberMedia's *First Aid 95*

features AutoFix technology and an extensive knowledge base of PC problems to identify and automatically fix problems. First Aid 95 runs silently in the background and pops up automatically when a problem occurs.

First Aid 95 compares the problem to its knowledge base, explains the problem and offers to fix it. It also intercepts crashes by shielding PCs from General Protection Faults. It warns users to save work and exit the application before it crashes. First Aid 95's knowledge base includes feature-by-feature details about configuration parameters. Users can download updated support files for the newest applications from CyberMedia's forum on CompuServe or CyberMedia's bulletin board system.

First Aid 95 costs $50.

▶ *CyberMedia*
(310) 843-0800

20/20 Software, Inc. has introduced PC-Install 4, installation software for Microsoft Corp.'s DOS, Windows 3.x, Windows 95 and Windows NT.

According to the Beaverton, Ore., company, PC-Install 4 lets users control the installation of software and data files. It lets developers customize the look and features of any installation by designating screen colors, personalizing titles, displaying custom graphics and writing installation messages in any language.

PC-Install 4 features support for password authorization to permit installation, the ability to update file registry information, automatic removal of files installed with PC-Install and an executable control file to prevent tampering with the installation.

PC-Install 4 is available in English, German, French and Japanese. It costs $249.

▶ *20/20 Software*
(503) 520-0504

Hewlett-Packard Co. has introduced the HP CopyJet and the HP CopyJet M, two color printer/copiers.

According to the Palo Alto, Calif., company, the two printer/copiers have 300 dot/in. color-copying capabilities, a flatbed copy surface holding up to 8½- by 14-in. documents and a double-hinged, removable document cover.

Both printer/copiers have digital document enhancement features, including enhanced light colors, color control for tuning color intensity levels, document scaling and lightness/darkness. They print at average speeds of up to 1½ page/min. for color documents and up to 7 page/min. for monochrome documents.

The HP CopyJet M includes Adobe Systems, Inc.'s PostScript Level 2, additional memory and an HP JetDirect print-server card for sharing in Macintosh, networked and mixed environments.

The HP CopyJet costs $2,495; the HP CopyJet M costs $3,199.

▶ *Hewlett-Packard*
(415) 857-1501

Product short

NMB Technologies, Inc. has started shipping the Right Touch Professional series keyboard. The keyboard was designed to save keystrokes by featuring three Microsoft Corp. Windows 95 function keys and Erase-Ease, a new backspace key made by splitting the space bar. Price: $70. NMB Technologies, Chatsworth, Calif. (818) 341-3355.





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CONSTRUCTION COMPANY BUILDS VIA VIRTUAL REALITY, 60
NEW PRODUCTS, 66

LANs • SERVERS • SOFTWARE FOR GROUPS

NT gains in business world

Managers push to synchronize Unix, NT servers

By Jean S. Bozman

Enterprise information systems managers are warily considering the best way to get their Unix computers and Microsoft Corp. Windows NT servers marching to the same beat.

IS' need to synchronize Unix and NT servers is increasing because both types of environments are used in corporate America. NT servers are handling workgroup applications in companies where Unix computers are well-established as database and application servers.

Servers, *page 64*

Mixing oil and water

Products to help users mix Unix with Windows 95 and Windows NT were announced at Unix Expo

Vendor/Product	Description	Price/Availability
AGE Logic XoftWare 4.0	PC-X server software that connects PC desktops to Unix servers	$395 (Windows 3.1); $495 (Windows 95 and Windows NT)/This month
Bristol Technology Wind/U 3.0	Windows-on-Unix porting tool kit that supports Microsoft's OLE 2.0	$9,950/November
Hummingbird Communications Exceed 5.0	PC-X server software that connects Windows 3.1 desktops and Unix servers	$545/Now
Network Computing Devices NTrigue	Displays Windows NT server applications on X terminals and Unix workstations	$400 to $500/November
WRQ Reflection X for NT	PC-X server software that connects Windows NT desktops to Unix servers	$469/This month

Operating system takes lead in financial field

By Mitch Wagner

Financial institutions nationwide are banking on Microsoft Corp.'s Windows NT Workstation as a desktop operating system for brokers, sales and support staff.

The companies are looking to NT to provide a stable, high-powered operating system with access to Windows applications.

"What choices do we have?" asked Mike Abbaci, senior vice president and chief information officer at Legg Mason Wood Walker, Inc., a brokerage in Baltimore. "We're a PC shop on the desktop, and that means Windows NT."

Michon Schenk, an analyst at The Tower Group, a financial consultancy in Wellesley, Mass., said the trend toward NT started about a year ago and accelerated in the past six to nine months. "Anybody in the Top 50 banks and the large investment houses and money managers have NT installed somewhere in the corporation," she said.

Going strong

By the end of the year, NT will be running on 190,000 seats — 22% of workstations — in the financial community, up from 9% last year, said John Dunkle, an analyst at Workgroup Strategic Service.

Information technology staffers at financial firms cited a desire for access to commonplace Windows applications, such as the Office suite.

"We wanted to give preference to commodity applications where the commodity applications exist," said Betsy Snow, senior vice president for distributed implementation and customer support at Charles Schwab & Co. in San Francisco. Schwab late last month disclosed plans to install 6,000 NT workstations by the end of the year.

Abbaci agreed that many institutions want Windows applications. "We believe in 'buy vs. build.' A lot of applications are available on NT," he said.

Finance, *page 60*

Warp Server beta impresses

Testers say it tops Microsoft offering

By Laura DiDio

A handful of the first beta users of OS/2 Warp Server say IBM's newest network operating system has many pluses, including easy installation, solid performance and a notable lack of hugs for a prerelease version.

During the past month, IBM released 12,000 beta copies of its OS/2 Warp Server network operating system. The product adds the best features of LAN Server 4.0 to OS/2 Warp, said Art Olberi, vice president of LAN Systems at IBM's Personal Software Products Division.

OS/2-Warp Server is an integrated file, print, application and database server that competes with Microsoft Corp.'s Windows NT Server 3.51. IBM's LAN Server had garnered about 14% market share in the first half of the year, according to International Data Corp. (IDC) in Framingham, Mass. IDC also found that the nearly 470,000 IBM OS/2 application server installations outnumber the 160,000 Windows NT Server sites by a 3-to-1 margin.

Far and away

Josh Airall, a systems analyst at Cincinnati Bell Information Systems, said he considers OS/2 Warp Server to be a year or two ahead of Windows NT Server in several areas. Those include object-oriented technology, real-time desktop management and dynamic domain named services.

The information systems arm of Cincinnati Bell, which comprises several thousand users at four U.S. sites, is deploying both the Warp Server beta and Windows NT Server.

Unlike NT, Warp Server interoperates seamlessly with other network operating system environments, such as Novell, Inc.'s NetWare and Banyan Systems, Inc.'s Vines, Airhall said. "OS/2 Warp Server today, with its real-time network management and dynamic domain named services, is equivalent to Microsoft's next generation of Windows NT, Cairo, which won't ship for a year," he added.

All the users with whom *Computerworld* spoke said they were surprised by the lack of hugs in the Warp Server beta.

"I expected many more problems, but so far I've only encountered a few minor bugs that are easily remedied," said Jason Jeremias, LAN administrator at Deloitte & Touche in Anchorage, Alaska.

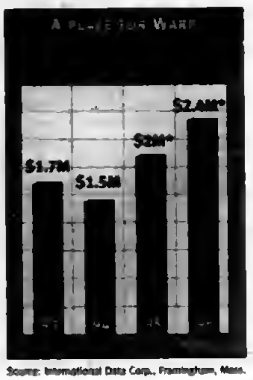
Other businesses cited Warp Server's conservative memory consumption as another area in which the forthcoming IBM network operating system has an advantage over the rival Microsoft platform.

"NT Server has proved much more of a resource hog than OS/2 Warp Server," said Abdul Nabi, systems administrator at University Bank and Trust in Palo Alto, Calif.

Nabi said Windows NT Server needs "at least 16M bytes to run smoothly and 24M bytes to achieve real speed on workstations and at least 32M bytes of server memory to support a small network." He claimed OS/2 Warp Server requires only 16M bytes of server memory and 8M bytes of workstation memory to achieve "the same level of performance as NT Server."

Still the one

Yet Nabi said he still considers Windows NT Server technically superior to OS/2 Warp Server in some key areas; NT offers better stability, security and crash protection and a more stable file system.



Source: International Data Corp., Framingham, Mass.

"It's a catch-22 because those features are what cause Windows NT Server to gobble resources," he said. "Overall, OS/2 Warp Server gives us more bang for the buck."

Bill Howey, a senior systems consultant at Avco Financial Services Corp. in Irvine, Calif., echoed those statements. He said he was pleased with the easy installation. "I clicked on Express install, answered seven questions, went off and had lunch and came back and the [network operating system] was properly configured," Howey said.

Amidst all the applause, however, users and analysts all pointed to one big "but" that could relegate Warp Server to niche-player status: IBM's lack of marketing muscle.

Tom Kucharvy, president of Summit Strategies, Inc. in Boston, said IBM can achieve mainstream success with OS/2 Warp Server if the company wins over its installed base in large corporate accounts.

If you build it . . .

Virtual reality models help trim construction costs

By Tim Ouellette

Companies planning to build large manufacturing and processing plants may soon get a chance to do a complete walk-through before spending a dime on construction.

Raytheon Engineers & Constructors in Philadelphia, a $3 billion subsidiary of Raytheon Corp., is using three-dimensional authoring software from MultiGen, Inc. to create virtual-reality-based walk-throughs of its large-scale construction projects.

"It gives us a sense of walking into a plant and reaching out for the valves," said Greg Lawes, virtual reality systems designer at the company. The software's modular design capabilities allow similar tanks, pipes and related gear to be used throughout the plant. Clients, in turn, come away with a better understanding of work spaces and access to equipment throughout the plant.

This eliminates the need to constantly redesign the building during construction. Such redesign usually adds to the final cost and often reduces profit on the contract.

"We can make the smart changes up front," Lawes said, noting that the use of a virtual reality system was not a frivolous use of new technology.

"This is not tigers morphing into cars — it's actually something that works," Lawes said. "And it is not a cheap thing to do or else everyone would be doing it."

Raytheon Engineers & Constructors uses computer-aided design (CAD) software to design the large processing and manufacturing plants it specializes in. But two-dimensional screens aren't adequate to visualize a building, Lawes said.

The MultiGen software converts the CAD data in MultiGen's OpenFlight database format — optimized originally for real-time flight simulations — adds texture and colors to surfaces and helps position all features of the building.

The benefit of a real-time 3-D simulation, or virtual reality, is that there are no preprogrammed situations; users just walk through where they want and view any object.

"Raytheon would have had to specifically create paths for a demonstration the night before," said Joe Fantuzzi, president of MultiGen.

Raytheon plans to use the system to help it decide which sections of a plant to build first, prepare maintenance schedules and train construction equipment operators.



Raytheon Engineers & Constructors *uses 3-D authoring software to create virtual-reality-based walk-throughs of its construction projects*

IBM blasts into derivatives trade

By Thomas Hoffman
NEW YORK

Maybe if Nicholas Leeson had been using a powerful derivatives pricing system such as Blaster, his employer, Barings PLC, wouldn't have gone belly-up.

By trading in derivatives, Leeson lost $1.4 billion in Japanese futures trading earlier this year and capsized Barings. But for other investment professionals, IBM's new Blaster analytical tool may be a salvation of sorts.

The IBM Deterministic Simulation Blaster is being touted as a tool that enables Wall Street traders to price complex derivatives products thousands of times faster than they can using current techniques.

Using a technique called deterministic simulation, the system minimizes the risks involved with derivatives trading by pinpointing a wider range of potential market factors. That technique pegs product price ranges faster and more accurately than the standard model, known as Monte Carlo simulation, that most traders use today.

Monte Carlo simulation uses random numbers to determine the likelihood of future events, such as a dip in petroleum futures. But the technique is not terribly accurate and is notoriously slow — complex models can often run for hours, said Jonathan Goodman, a professor of mathematics at New York University's Courant Institute of Mathematical Sciences.



IBM's Deterministic Simulation Blaster *gives financial traders a panoramic view of a financial landscape*

In one case, Blaster let traders cut derivatives pricing from 90 days to less than 15 seconds using an IBM RS/6000 Model 560 multiprocessor workstation, said Todd Hovanyecz, director of IBM's Mathematical and Analytics Computation Center.

Blaster can be made to run on any platform, including Sun Microsystems, Inc. Unix SPARCstations and IBM SP/2 parallel processing hubs.

But some potential customers are frowning at the stiff price tag: An average Blaster site license, including consulting services, costs about $1 million.

"The question is whether it's worth spending a million dollars on this now or wait 'til an academic mathematician publishes a comparable algorithm in six months," said Paul Wanuga, a fixed-income research associate at J. P. Morgan & Co. in New York who saw a demonstration of the system two weeks ago.

Lotus goes both ways

By Suruchi Mohan

Lotus Development Corp. last week announced NotesPump 1.0, its link to enterprise databases. The server-based application, shipping later this month, allows for a bidirectional flow of data between Notes and relational databases.

To use NotesPump 1.0, administrators need a Notes server, a NotesPump Server and a relational database server. They can then write an application specifying what information they need, what would trigger it and where on a database they want the information to reside.

The product supports Sybase, Inc. and Oracle Corp. databases and comes with an Open Database Connectivity (ODBC) link that will work with any ODBC-compliant database. For example, IBM DB2 users can use the ODBC link. IBM's replication technology can move that information to relational and nonrelational systems.

NotesPump 1.0 puts Lotus in competition with some of its business partners that provide similar capabilities, although the company denies any such attempt. Brainstorm Technologies, Inc., Casahl Technology, Inc. and Percussion Software, Inc. announced similar capabilities earlier this year.

"There is some perceived overlap with business partners," said Tim Dempsey, director of Notes product marketing in Cambridge, Mass. "We have been very public about bidirectional data flow," he said. At $7,995, NotesPump 1.0 isn't priced to kill the competition.

"The integration of corporate data with Notes is too important to be left with small developers," said David Marshak, vice president at Patricia Seybold Group in Boston.

Finance

CONTINUED FROM PAGE 59

Legg Mason plans to begin rolling out 2,000 NT workstations early next year.

"One of our goals was to manage a lights-out installation" — in other words, to administer NT remotely — said Ritch Gatti, first vice president of advanced office systems and technology at Merrill Lynch & Co. in New York. The company didn't believe that Unix, for one, had those capabilities.

Some companies said they have rejected OS/2 because of the lack of native software and the fear that it might not continue to be supported in the future. "We looked at OS/2 really carefully," Gatti said. "We liked it very much, [and] we did a lot of experimentation, but we just didn't think it would be viable in the future."

In many cases, NT gets preference to Microsoft's Windows 95 because of a perception of greater stability and more networking functionality. "Other Windows just don't have the resources necessary for high-end applications," said Bart Shemp, a technology manager at Norwest Bank International in Minneapolis.

"Windows 95 is looked at as the low end, a next-generation 3.1," said John Dunkle, an analyst at Workgroup Strategic Service, a financial industry consultancy in Portsmouth, N.H. He said Windows NT is optimized for the coming Pentium Pro, or P6, processor, while Windows 95 is not.

The benefits of electronically extending your enterprise have never been more compelling: closer bonds with customers and suppliers, better project coordination, and new distribution channels for goods and services. But bringing down the walls between businesses also raises new challenges: ensuring secure electronic commerce, managing complex projects between companies, and supporting highly distributed teams. The question is, how can today's businesses build inter-enterprise applications that offer security, reliability, scalability, and seamless user support?

Until recently, e-mail, electronic data interchange (EDI) and public networks such as the Internet defined the scope of inter-enterprise connectivity. These tools work well for simple information exchange and structured transactions, but are not well-suited for collaborative business-to-business applications that move documents through a multi-step process. To broaden the possibilities of an extended enterprise, a company should consider several criteria in choosing its communications platform:

- Cross-platform support for heterogeneous operating environments
- Robust, multi-level security
- Open and flexible connectivity
- Rapid development and deployment capabilities for custom applications
- Tools for mobile user participation in work processes.

To meet these requirements, enter Lotus Notes,® the ideal tool for extending your business. Because any system connecting a business to its customers or suppliers must accommodate a wide variety of computing platforms and networks, Lotus Notes runs on all popular operating systems, including Windows® and Windows NT,™ OS/2 Warp® and AIX,® Macintosh,® Sun Solaris,® HP-UX,™ SCO OpenServer,® and as a NetWare® Loadable Module (NLM).

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Notes also includes bidirectional replication to manage the complexity of application updates between companies. Notes replication distributes not only data, but the latest application design as well. With Notes, inter-enterprise applications that support team problem-solving and automated workflow become possible. Notes even offers a full range of choices to integrate your legacy and relational systems into these new collaborative applications. And Notes networks can scale to support up to 100,000 users with the appropriate server infrastructure.

Many companies have redefined their inter-enterprise business processes using Notes. Others have built entirely new businesses around it.

- A software company has built a Notes-based business partner network which *continuously* updates resellers with the latest product information, technical notes, and even customized pricing. The result: faster time to market for products, shorter sales cycles, and improved customer service.
- New network-based businesses are linking buyers and sellers in secure electronic commerce anywhere in the world. These new companies offer services from brokering the disposal of hazardous waste materials to helping insurance companies negotiate significant savings on legal bills through precise job tracking and prompt electronic payments.
- For highly distributed collaboration, many companies are outsourcing WAN communications and finding value in managed, private Notes network services. Through AT&T Network Notes,™ a joint venture between Lotus® and AT&T® to provide Notes-based services over the AT&T Worldwide Intelligent Network, AT&T provides application hosting, WAN and server management, customized billing, and administration and support services.

Ultimately, whether you choose to manage your WAN or outsource it, you must build an inter-enterprise communications environment on a firm foundation. **Only one groupware product lets you create applications for mission-critical business processes, whether your world headquarters are in a skyscraper or a spare room. Lotus Notes.**

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Servers

CONTINUED FROM PAGE 59

NT's main attractions are ease of use, compatibility with Windows-style applications and PC hardware platforms that are less expensive than Unix-RISC systems.

Also, NT applications run across many platforms, including Intel Corp.'s Pentium and P6, IBM/Motorola Corp.'s PowerPC and Digital Equipment Corp.'s Alpha, without change. Unix users must port applications from one RISC platform to another.

"There are a lot of [information technology] organizations that would like to have a consistent environment, and they lament that it will be mixed," said Scott Winkler, an operating systems analyst at Gartner Group, Inc. in Stamford, Conn. "They know they can't keep NT out because users will buy it."

But in most cases, users are adding NT servers for new tasks, not throwing Unix servers out, he added.

No easy task

Mixing Unix and NT servers in one network is possible. That much was demonstrated at Unix Expo in New York last month. But Microsoft refers NT users to its business partners, such as Digital, for installation and consultation about NT's use with Unix systems.

And users often turn to third-party firms to bridge the gaps between the Microsoft and Unix environments (see chart, page 59). PC-X server software displays Unix applications on Windows NT screens and vice versa, while relational database links also tie NT and Unix servers together, according to users.

Choosing the right operating system for new server tasks isn't always easy. "NT is not where it should be in stability and all of the features and functions in high-end Unix systems, but it's closing the gaps rather quickly," said Tsvi Gal, a senior IS vice president at BankAmerica Corp. in Concord, Calif.

High-end server tasks will go to Unix computers for some time because Unix can support more processors in a single box, Gal said. But Microsoft's clustering technology soon will allow an array of small servers to support large database tasks and applications. Many of the NT servers in those clusters will have four CPUs or fewer.

"You're going to see a monumental jump in the scalability of local clusters," Gal said.

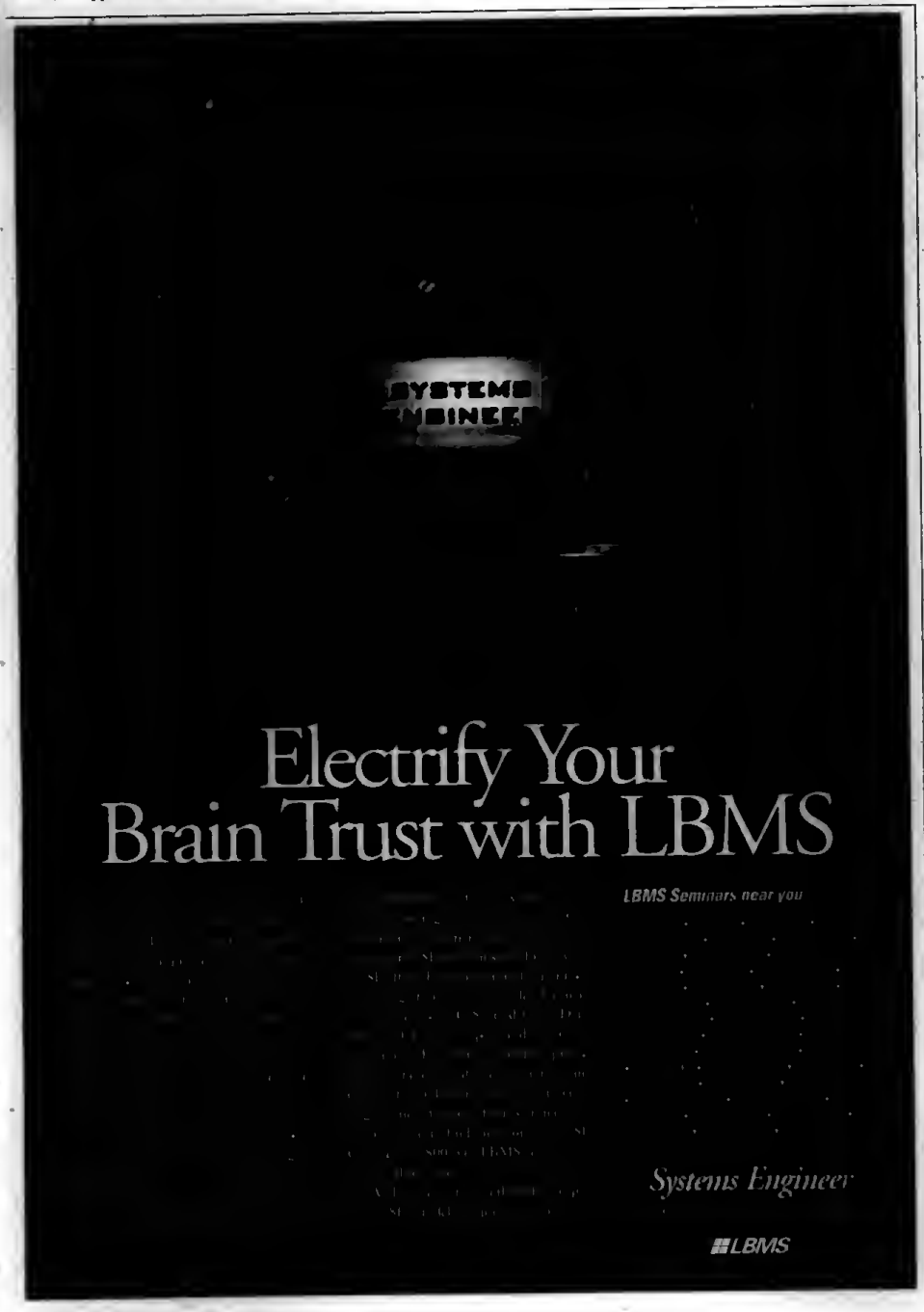
Even so, many sites with a mixture of PCs and Unix systems are concerned about placing all operating system orders with Microsoft.

"I don't have a strenuous objection to NT, but I don't want it to be the only solution. I like to have my options open," said Daniel Hunt, a systems manager at W. T. Quinn, Inc., an advertising agency in Somerset, N.J., that runs Novell, Inc.'s NetWare and Unix servers.

Long time coming?

How long can this IS tango between Unix and NT servers go on? Until 3-year-old NT can get in step with its 20-year-old operating system rival, industry analysts said. NT needs more seasoning, including systems management tools, network management tools and scalability to match Unix capabilities. And that could take years, analysts said.

"I think that the perception right now is that Unix is the best environment for enterprise, mission-critical applications and that NT is optimized for workgroup applications," said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "Meanwhile, you want to make them work together."



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Keyfile Corp. has announced the Keyfile Document Server for Microsoft Corp.'s Windows NT.

According to the Nashua, N.H., company, the Keyfile Document Server enables users to electronically handle office documentation, both paper and electronic, by providing a tool for filing, retrieving, sharing, distributing and automating document management. It features functionality in version control, workflow and document management.

Pricing for the Keyfile Document Server starts at $7,995. Client software is priced separately; pricing begins at $795.

▶ *Keyfile*
(603) 883-3800

Frontier Technologies Corp. has introduced CyberJunction, a Microsoft Corp. Windows NT server-based product that offers Internet access, TCP/IP and host connectivity for Novell, Inc. NetWare environments.

According to the Mequon, Wis., company, CyberJunction combines a transmission gateway with a suite of Internet and host connectivity applications to let NetWare users quickly connect to the Internet and other hosts. It is a Windows NT-based IPX-to-IP gateway that eliminates the need for TCP/IP software on every desktop. It was designed for workgroups and includes a complete set of Frontier's TCP/IP and Internet applications, including a multiprotocol, commercial-grade browser, an Internet organizer, electronic mail, Telnet terminal emulation and remote utilities. Neither the NetWare server nor client have individual IP addresses; this protects the LAN from Internet intrusions.

CyberJunction is bundled with Frontier's World Wide Web server, SuperWeb, which lets NetWare users improve internal and external communication through the Web.

Pricing for CyberJunction starts at $1,795 for a five-user package.

▶ *Frontier Technologies*
(414) 241-4555

Biscom, Inc. has introduced Faxcom/Workgroup for NetWare.

According to the Chelmsford, Mass., company, Faxcom/Workgroup for NetWare lets PC users on Novell, Inc. NetWare networks send and receive faxes sharing a fax modem connected to a file server. It was designed for small workgroups of 10 to 50 users. As many as four fax modems can be controlled by a NetWare Loadable Module running on a NetWare file server.

The product manages private and public fax telephone books and interfaces to scanners for faxing hard-copy documents. It lets users view, rotate, annotate and forward faxes and converts faxes to text with optional optical character recognition. It supports Microsoft Corp.'s DOS, Windows 3.1, Windows 95 and Windows NT and IBM's OS/2.

Pricing for Faxcom/Workgroup for NetWare starts at $695.

▶ *Biscom*
(508) 250-1800

Imagery Software, Inc. has unveiled GroupStore HSM 2.0, a hierarchical storage management (HSM) product.

According to the Lowell, Mass., company, GroupStore HSM 2.0 is a storage management product designed for Novell, Inc. NetWare 4.0 environments that provides distributed storage management capabilities to networked applications. The product implements a storage model that has related files and compound objects managed through a file cycle and data sets that move through a hierarchy of storage based on the requirements of an application or user group.

GroupStore HSM 2.0 gives administrators the ability to configure file migration by age of the file, creation date, file size and frequency of access. It also lets them perform on-demand and scheduled migration and assign files to specific optical platters. It provides current statistics about volume usage, media pool usage and migrated file information.

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Enterprise Networking

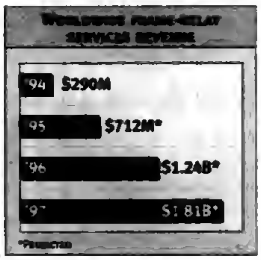
INTERNETWORKING • SERVICES • NET MANAGEMENT

Frame-relay nets growing up, out

By Bob Wallace

Frame relay once was pitched primarily for linking far-flung LANs. Now, it is fast becoming an all-purpose, global data service for carrying voice, fax and IBM SNA traffic.

In frame relay's favor is its status as a public network service that costs 30% to 40% less than dedicated private lines. Because of its speed and digital links, some call it X.25 on steroids.



Source: The Yankee Group, Boston

But analysts warn that long-haul carriers and equipment providers face serious challenges as they struggle to support a service that is spreading like wildfire while making it more robust and versatile.

"They're all being crushed under the weight of user requests for [frame-relay] service," said Jim Fay, director of strategic technology at Private Mortgage Insurance Corp. (PMI), a WilTel frame-relay user since 1992. "It's still a concern for users and will affect where they take the service." PMI uses a 30-site, nationwide frame-relay network to support a mortgage insurance application.

Analysts agreed with Fay.

"There's a huge potential market for expanding the use of frame-relay service, but the carriers need to make sure they have the network infrastructure in place, which is no small task," said Christine Heckart, director of broadband consulting at TeleChoice, Inc., a Verona, N.J., consultancy.

Heckart said the long-haul carriers are doing a fair job adding switches to their networks to support soaring demand.

"They're preoccupied with adding switches to their frame-relay networks, which means they're not focusing much on how to add value to the service," she said.

Answering demand

One longtime frame-relay provider said demand for the data service has forced it to make two major changes to its nationwide network.

"We're upgrading our frame-relay network to an ATM backbone in the first half of 1996 and plan to deploy higher-density frame-relay switches from Alcatel Data networks at the edge of the backbone network," said Brad Hokamp, director of advanced data services at Sprint Corp.

Potential benefits for users in-

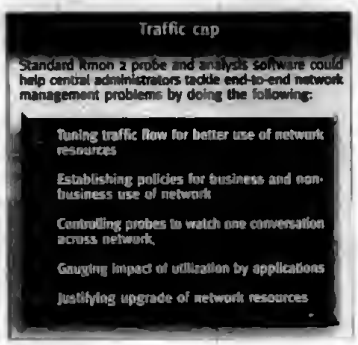
Frame relay, *page 82*

LAN tools to tighten client/server control

By Patrick Dryden

Standard tools for a top-down view of client/server networks should ship by year's end, helping central staffs manage complex interactions at the core of their business systems.

Currently, standard Remote Monitoring (Rmon) probes gather statistics from a single network segment and report them across a wide-area network for a central management application to diagnose.



Because they let network administrators remotely monitor LANs, Rmon tools can help companies save big money. For example, organizations with 100 or more segments doubled the productivity of their management staffs and saved $400,000 or more in salary, according to a study by McConnell Consulting, Inc. in Boulder, Colo.

The next version of the Rmon software, Rmon 2, promises even more assistance. Central managers of enterprise networks will get an end-to-end view, with hooks for monitoring applications the way some proprietary technologies do now.

One user found that Rmon probes took significant time from technicians' days.

Northern Indiana Public Service Co. (NIPSCO) started using Axon Networks, Inc.'s Rmon probes because problems on its 80 LANs required as much as 12 hours to fix, including "windshield time" spent driving to and from remote sites.

Before getting the remote probes, technicians traveled to sites with a protocol analyzer so they could capture and analyze snapshots of LAN traffic. Axon's probes and monitoring software cut those troubleshooting tasks to 15 minutes, according to Kevin Morris, lead systems software specialist in charge of the WAN at the Hammond, Ind., utility.

Rmon 2 cometh

This month, a working group in the Internet Engineering Task Force expects to publish the draft specification for Rmon 2. The updated version will enable probes to report on higher-level traffic — through the application layer, not just on the low-level network plumbing — and coordinate their views for a clear, overall perspective of the entire network.

"Rmon lets you see one room very well, but Rmon 2 will let you see the whole house," said John McConnell, president of McConnell Consulting.

LAN tools, *page 76*

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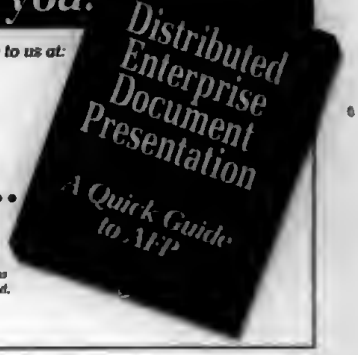
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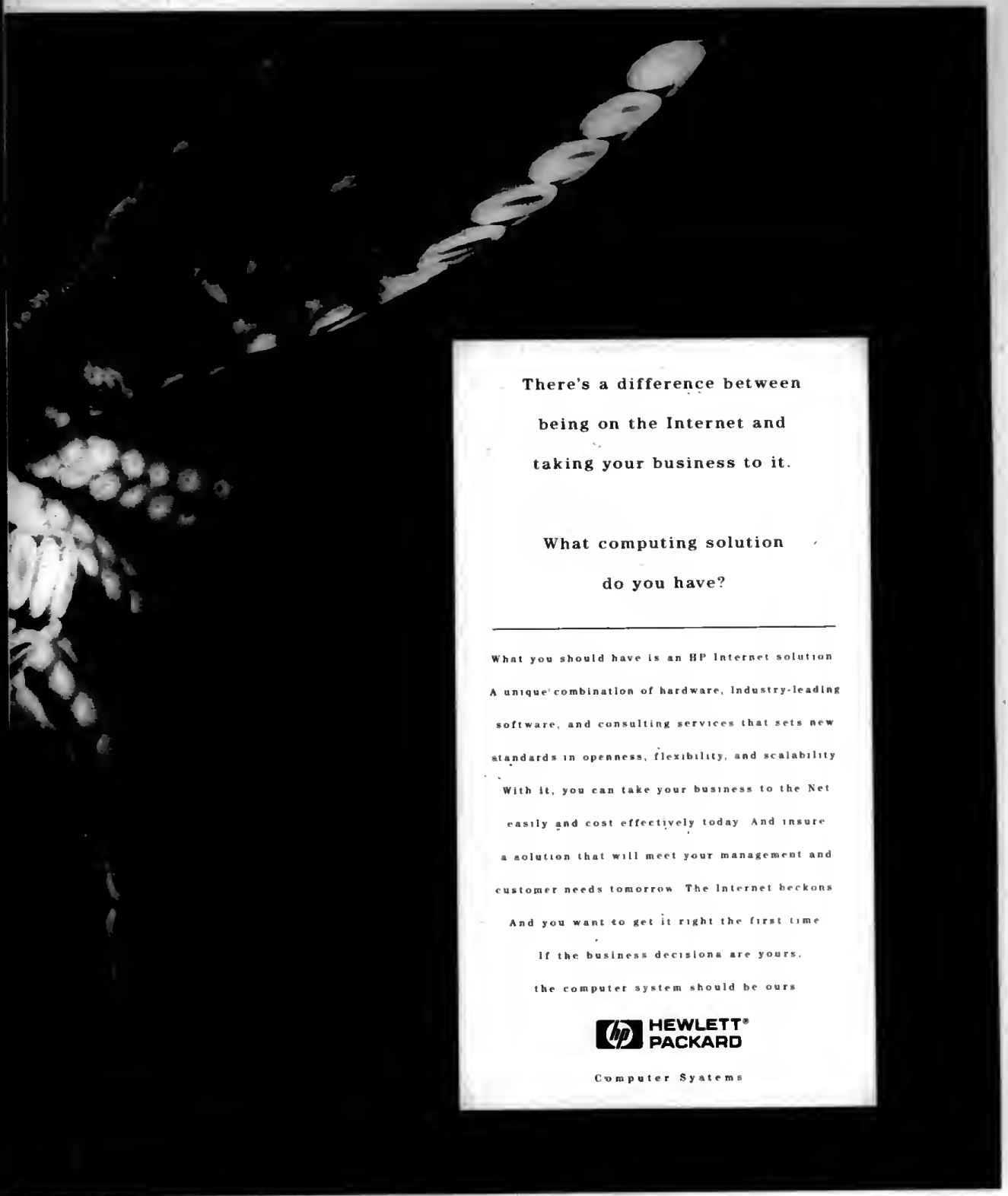
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Computer Systems

Acrobat adds 'net support

Technology lets users view documents from Web

By Lisa Picarille

Internet users may benefit from Adobe Systems, Inc.'s efforts to establish its Acrobat portable document exchange technology as a de facto standard.

Acrobat lets users view and exchange electronic documents that retain their original formatting, complete with graphics, fonts and layout. Adobe is adding capabilities that allow Internet users to view Acrobat documents directly from their own World Wide Web browsers, rather than by launching Acrobat.

Acrobat runs on DOS, Windows, Apple Computer, Inc.'s Mac OS and Unix systems. Acrobat for IBM's OS/2 Warp and OS/2 for the PowerPC operating systems are due out next year.

Amber waves

Adobe's new technology, code-named Amber, is an extension of Acrobat's application programming interface. Amber integrates the view, search and link capabilities supported by the Web. This lets users view Acrobat's Portable Document Format (PDF) file directly from their Web browser.

A prototype of Amber will be available to Acrobat users by the end of the month. The Amber technology is slated to be incorporated into beta versions of Netscape Communications Corp.'s Navigator 2.0 for Microsoft Corp.'s Windows 95 and Windows NT. And the new version of Acrobat, with Amber, is due out in the first half of next year.

Portable document exchange products

have creation and reader portions to allow users to create documents that can be distributed electronically and viewed by other users regardless of what applications or platform the documents were created on

Adobe Systems	Acrobat 2.0
Common Ground Software	Common Ground 2.0
Farallon Computing	Replica 1.01
WordPerfect	Envoy 1.0

However, one user said although Amber has significant appeal, decentralized organizations find it difficult to get end-user buy-in. This, in turn, means it is unlikely that all departments use PDF, which limits the technology's benefits.

"It seems like one of the primary benefits of the technology happens when everybody is using it," said Mark Hagen, lead microcomputer consultant at the Administrative Computing Group at Boston University's Information Services Division. But "we don't push standards downstream or create corporate mandates."

Amber is just one part of Adobe's strategy to gain a foothold in the Internet publishing market. The Mountain View, Calif., company already has a handful of products, including Illustrator and Photoshop, that are popular with users creating graphics for the Web, according to observers.

And Adobe recently paid a reported $50 million for Ceneca Communications, Inc., a start-up that develops PageMill, a Web site authoring system, and SiteMill, a Web site administration program.

Adobe's only missing piece is servers for Web pages. It missed one chance to acquire this technology when StarNine Technologies, Inc., a Berkeley, Calif., maker of Web servers for the Macintosh, was purchased late last month by Quarterdeck, Inc. in Santa Monica, Calif.

Compare and contrast

A sampling of Web server software

Company	Product	Platforms supported	Price	Availability
Frontier Technologies	SuperWeb	Windows NT	$795	Late this year
I/Net	WebServer 400	OS/400	$1,250	Available now
IBM	Electronic Publishing Edition	OS/2	$1,400	Available now
The Internet Factory	Commerce Builder	Windows NT, Windows 95	Not available	Available now
	Communications Builder	Windows NT, Windows 95	Not available	Available now
Microsoft	Gibraltar	Windows NT	Not yet determined	Beta tests late this year
NaviSoft	NaviServer	Unix, Windows NT	$4,995 (Unix), $1,495 (Windows NT)	Available now
Netscape	Commerce Server	Unix, Windows NT, DEC OSF/1	$4,995 (Unix), $2,995 (Windows NT)	Available now
	Communications Server	Unix, Windows NT, DEC OSF/1	$1,495 (Unix), $795 (Windows NT)	Available now
Open Market	WebServer	Unix	$1,495	Available now
	Secure WebServer	Unix	$4,995	Available now
O'Reilly and Associates	WebSite	Windows NT, Windows 95	$499	Available now
Process Software	Purveyor	Windows NT, Windows 95, Open VMS, NetWare	$495 (Windows NT); $295 (Windows 95); $1,195 (Open VMS); $500 (NetWare)	All versions available except for NetWare, which is due out later this year
StarNine*	WebStar	Macintosh	$795	Available now

*Acquired by Quarterdeck Corp. in Santa Monica, Calif., late last month

http:

Buy, sell or trade



ON-LINE RETAILERS ARE POPPING UP all over; most are focused on selling PC software and hardware. Some of these World Wide Web outlets offer networking products, too. Although almost all of the stores tout lower-than-low prices, don't press that "Order Now" button in haste. In cyberspace, as on Earth, be a smart shopper.

■ **First, The Internet Mall** is an index of on-line shops, including those that specialize in computer equipment. Here, at **http://www.mecklerweb.com/imall/**, you can get a listing of who sells what over the Internet.

If, on the other hand, you pretty much know what products you're looking for, visit any one of a number of computer-specific retailers:

■ **GreenPages**, at **http://www.ocm.com/greenpages/default.htm**, claims that IS professionals can get "deals better than the Fortune 1,000 get" by buying software and hardware here. Having a Web site rather than a physical franchise means GreenPages saves money on print advertising and catalog printing, the company says. Products from 900 manufacturers are offered, according to information recently posted at the site.

■ April 1994 saw the launch of **Necx Direct**, a site that offers 20,000 products in 15 categories, all searchable by keywords. A "Super Deal" button leads users to daily specials and other discounted merchandise. Roughly 50,000 different users access **http://necxdirect.necx.com-/decroot/index.html** weekly, logging 1 million hits, said general manager Scott Randall. Necx Direct, which has no ties to the computer maker NEC, is based in Peabody, Mass.

■ **CyberSource Corp.** in Menlo Park, Calif., runs **http://software.net**. The 8,000-product inventory of this on-line store is also searchable. Recent deals included Starfish Software's Sidekick for Windows 2.0 personal organizer for $29.95 and a copy of Microsoft Corp.'s Windows 95 for $89.95. Tax and shipping are free for all electronic – or downloaded – deliveries.

■ If you have the willies about doing business on-line, seek out the Web site of the **Better Business Bureau** for details about bureau services and how to contact local offices of the watchdog group. The site, at **http://www.cbbb.org/cbbb/**, also contains rules and regulations that govern advertising and dispute resolution.



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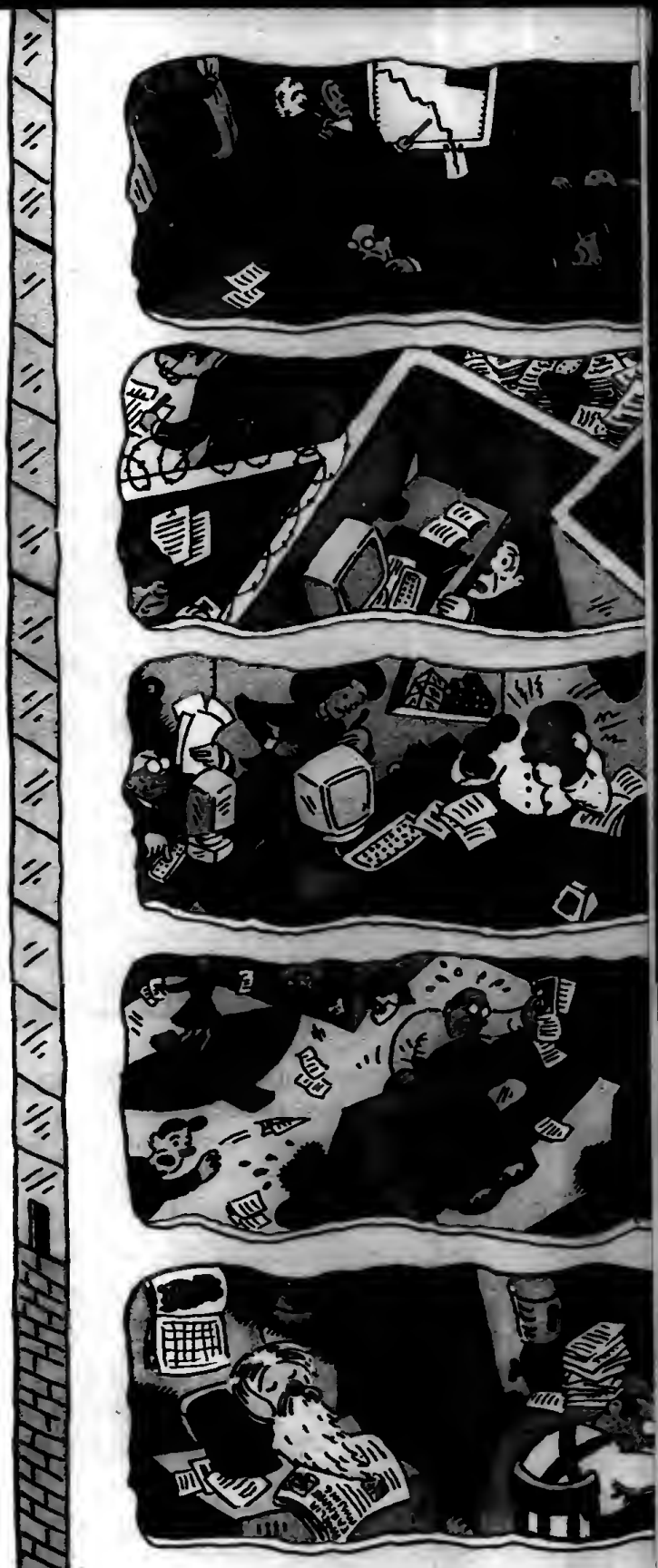
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LAN tools

CONTINUED FROM PAGE 69

Last month, Armon Networking, Inc. in Santa Barbara, Calif., and Frontier Software Development, Inc. in Chelmsford, Mass., demonstrated precursor Rmon 2 software.

Axon's Traffix Manager is most compatible with the emerging Rmon 2 definition, according to McConnell. This Unix-based application collects and correlates data from multiple Rmon and Rmon 2 probes. Traffix Manager provides a top-down view into total network traffic through logical groupings such as protocol, geography or type of system, according to Peter Palmer, president of Axon in Newton, Mass.

For example, instead of just showing the overall flow of TCP/IP traffic, Traffix Manager lets the user examine selected servers.

Teaming up

Axon recently announced partnerships with 3Com Corp., IBM and Optical Data Systems, Inc. to adopt its current Rmon tools and prepare for Rmon 2 capabilities.

Bay Networks, Inc. launched a suite of Rmon tools for its network management software and embedded probes in its routers as well as additional hub models. Through a partnership with Armon, Bay Networks intends to support Rmon and Rmon 2 across all internetworking gear.

Morris said he looks forward to testing Axon's Traffix Manager.

"The Rmon probes saved us time looking at individual LANs and kept us here to handle other problems," Morris said. "Now we can sit down and look at the whole picture through Rmon 2 tools to evaluate interactions and act proactively."

Big 3 telecom carriers move to unscramble pricing picture

By Neal Weinberg
ATLANTA

Acknowledging that their pricing schemes give users headaches, the long-distance carriers offered an aspirin here at last week's Networld/Interop '95.

AT&T Corp. launched its Network Notes service last month with a complex pricing plan that had users scratching their heads. The company is now offering Notes on a wide-area network for a flat fee of $39 per month from one end point to another, for the first two hours of dial-up use.

Simpler scheme

"Our early customers said our customized pricing was too complex," said Gary Hickox, vice president of AT&T's Applications and Imaging Services. Network Notes users will now pay a flat $10 per hour for additional access. A frame-relay connection, by contrast, is $360 a month. In addition, AT&T will charge a $2,500 monthly service management fee that covers network management and billing.

MCI Communications Corp., meanwhile, scrapped its six-zone, per-mile charges on frame-relay service and replaced them with a simplified fixed-rate plan. In addition, MCI is offering a usage option so customers never pay more than the fixed monthly rate, but they could pay less, if usage is less.

Under the new structure, users with longer-distance links will see their hill shrink slightly, while costs will rise a bit for users with shorter distances between nodes.

MCI's Hyperstream frame-relay service

- 50-node star network
- One permanent virtual circuit per location
- Remote locations average 750 miles from host
- 56K bit/sec. port at remote locations, 1.5M bit/sec. port at host site

Price: $11,760 per month

MCI also plans to streamline pricing soon for its other high-speed services, Switched Multimegabit Data Service and Asynchronous Transfer Mode.

And Sprint Corp. launched a program to help customers manage the costs of migrating to a higher bandwidth service. For example, Sprint will allow customers to maintain both old and new systems for a single charge during the transition period.

That's not all, folks

The carriers also rolled out several new products and services:

- Sprint is targeting businesses with IBM's SNA setup that typically have private line wide-area connections. In November, Sprint will offer a software interface that allows SNA networks to access the less expensive frame-relay service.
- MCI beefed up its NetworkMCI Business software so that electronic mail, fax and paging are integrated into one package. The software, which sells for $100, also provides for Internet connectivity, personalized information retrieval services and document conferencing at up to 24 locations.
- MCI is offering its existing customers a free upgrade to NetworkMCI Business. Monthly charges for the service are $35 for customized news and business reports, $9.95 a month for Internet access with five free hours and $120 a month for desktop videoconferencing.

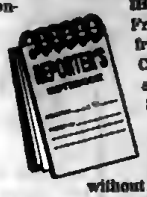
MCI also announced a joint marketing alliance with Information Resource Engineering, Inc. (IRE) to offer an Internet security service that combines IRE's security products with MCI's Internet access.

Reporter's Notebook

Hewlett-Packard Co. in Palo Alto, Calif., last week announced its first 100M bit/sec. Ethernet interface. Called 100VG-AnyLAN, it competes directly with Fast Ethernet. Both technologies offer users 10 times the bandwidth of shared-bandwidth Ethernet for less than twice the price of accompanying PC adapter cards. The 100VG interface is for the vendor's AdvanceStack Router 650 and will enable users to link 100VG islands for the first time. The interface is shipping now for $6,495.

Cisco Systems, Inc. in San Jose, Calif., last week announced CiscoPro CPA753, an Integrated Services Digital Network (ISDN) remote access router designed for telecommuters and home- and small-office users. It is the first product resulting from Cisco's purchase of ISDN remote access products giant Combinet, Inc. in August.

The product has one Ethernet port, a port for an ISDN telephone and an analog port for an analog telephone, fax machine or modem. It also comes equipped with Cisco Connect, a Windows-based installation and configuration software tool. The product supports IP and Novell, Inc. IPX protocols and has 4-to-1 data compression. Priced at $1,200, it will ship by mid-month.

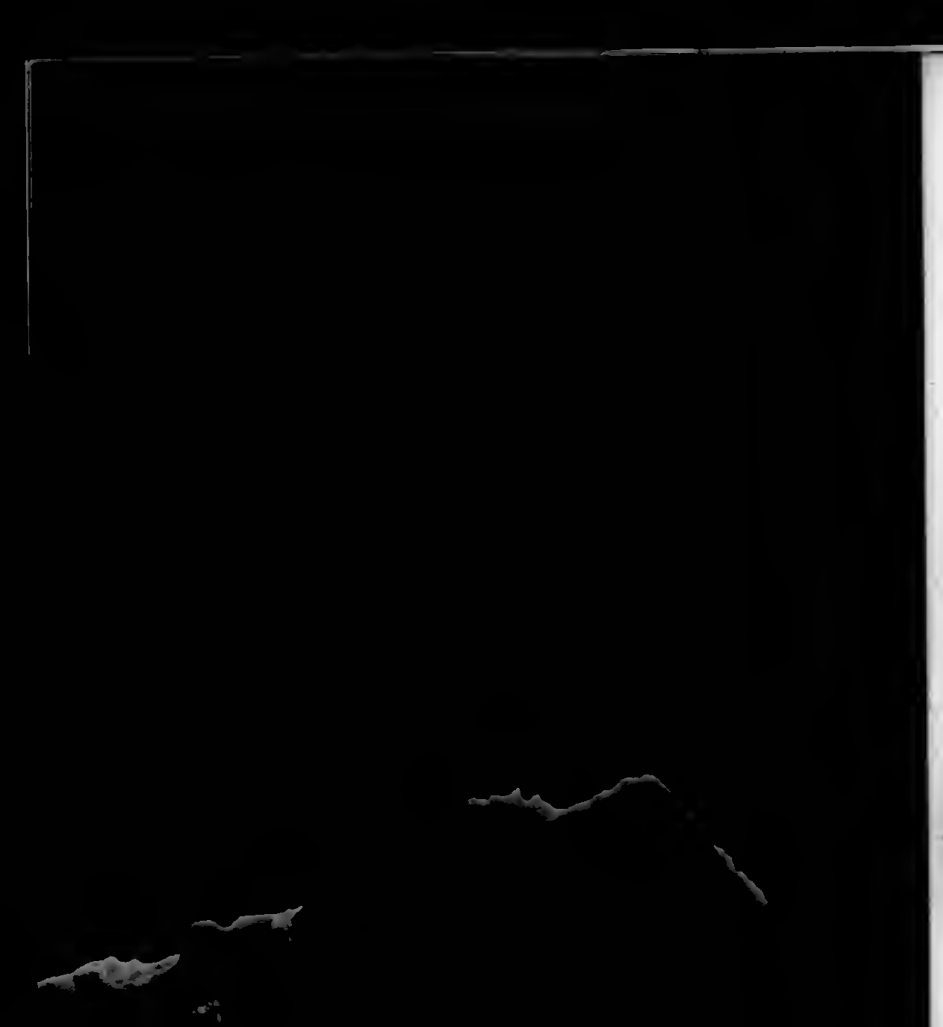


Interphase Corp. in Dallas is shipping three new products that extend the vendor's line of Fiber Distributed Data Interface (FDDI) adapter cards. The 5511 Peripheral Component Interconnect FDDI Adapter for PCI-based PCs, workstations and file servers starts at $695; the 4911 GIO FDDI Adapter for Silicon Graphics, Inc. Indy and Indigo systems running the Irix operating system starts at $1,195. The M400 FDDI Concentrator, a desktop FDDI concentrator with four or eight ports, supports two types of cabling: twisted pair or fiber. Prices range from $499 per port for an eight-port, twisted-pair unmanaged unit to $695 per port for an eight-port fiber-managed unit.

IBM will market Sync Research's FrameNode line of multiprotocol frame-relay access devices and ConversionNode family of serial-to-LAN conversion products. Sync, based in Irvine, Calif., makes devices for IBM users looking to cut costs by sending SNA transmissions with or without LAN traffic over public frame-relay services instead of private lines, which cost 30% to 40% more.

Andrew Corp. in Orland Park, Ill., is shipping StackLynx, a product line that includes a 16-port Token Ring Media Access Unit (MAU), a 16-port Ethernet hub and a Simple Network Management Protocol (SNMP)-based management package. The first two products can operate as stand-alone managed units; they can also work together in a stack configuration that supports up to 80 users in remote branch offices linked to large sites using private lines or frame-relay connections. The SNMP package is called Andrew Stackwatch for Windows and can manage the new MAUs and hubs. The StackLynx MAU and Ethernet hub cost $1,799 and $1,298, respectively; the management package costs $495.

PCSI in San Diego will ship the Access Plus 200 next month. The product is an integrated access multiplexer designed to save money by consolidating voice, data and fax traffic over a much smaller number of wide-area network links. Users can send up to 30 channels of voice and 15 channels of data into the system. The voice channels take less bandwidth than they usually would because the Access Plus 200 uses voice compression. Users can dynamically allocate bandwidth between traffic types based on user-configurable parameters. Pricing for the unit starts at $4,250.



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Making a big 'think' about technology

By Lisa Picarille
SAN FRANCISCO

Information systems managers who think the fall of communism and other global social issues have little or no impact on the future of technology better think again.

In the future, social factors will affect information systems in a number of ways:

- How technology is delivered to users.
- Who tomorrow's hardware and software makers will be.
- What technology will look like.

So said some of the world's leading social critics and technologists speaking here at last month's Millennium Conference.



Panel participants

The panel of the Millennium Conference included the following participants (left to right): Lester Thurow, professor of management and economics at MIT's Sloan School of Management and coordinator of the school's Asia/Pacific Initiative; George Gilder, often called the father of supply-side economics, founding editor of *Forbes ASAP* and a senior fellow at the Discovery Institute in Seattle; Alvin Toffler, noted social critic, futurist and author; Andrew S. Grove, co-founder, president and chief executive officer of Intel in Santa Clara, Calif.; and Carol Bartz, chairman and CEO of Autodesk, Inc. in Sausalito, Calif. The panel was moderated by Paul Saffo, a director at the Institute for the Future in Menlo Park, Calif.

'net effect

Led by George Gilder, a former adviser to President Reagan, the speakers sketched a generally rosy picture of an on-line world where PCs and the Internet will eventually supplant television and the movies as a main source of entertainment.

"The Internet is the most important factor in the world economy today," Gilder said. "It's an immense breakthrough that will transform the entire world economy."

But Andrew S. Grove, Intel Corp.'s co-founder, president and chief executive officer, seemed to sharply disagree, saying that today the 'net is mostly hype. Grove said the basic platform must evolve into what he called "the communicating PC," a PC with videoconferencing and high-speed digital connections. This type of platform could prove a "major delivery vehicle for globalization in the future," he said.

The industry has to go somewhere if U.S. companies are ever to achieve true benefits from computing, Carol Bartz claimed. She said technology is still in a "toddler stage."

"Investing in technology is like having a baby," Bartz said. "It's an expensive and emotional experience, and once you get it, you don't have a clue what to do with it."

For example, 85% of the service industry and related fields has invested heavily — more than $800 billion — in information technology, and there have been "no real productivity gains," Bartz said.

"It's the ultimate insult when a computer creates more work for users," she said.

Like Grove's idea of the "communicating PC," Bartz predicted that additional trends in software will help unlock the potential of the computer — collaborative computing, three-dimensional visualization and content-based software.

The fall of communism

Lester Thurow predicted that social and economic forces outside the computer industry will affect technology more than development trends. For instance, as countries such as Russia and Communist stalwart China move to more capitalistic economic models, competition in the hardware and software industries will heat up and affect the way U.S. corporations operate. How? For one thing, global communications via the Internet and electronic mail will allow companies to employ workers from around the world.

"If educated Chinese workers can be employed for a fraction of what U.S. workers are paid for the same task, that will have a huge impact," Thurow said.

A small world, with lawyers

Alvin Toffler argued that as technology allows for far-flung communications, the economic power and technological leadership of the U.S. will also diminish. The ability to effectively do business on a global basis will offer opportunities. For example, a company in Hungary can create, market and deliver unique software technology — all via the Internet — to anyone who wants them.

Toffler also said politics may yet prove mightier than processing power when it comes to global business. He said that while it may seem like technology is making the world smaller, doing business, regulating copyrights and communicating in many languages remain daunting.

Tool kit helps managers size up net performance

By Steve Moore

Users came closer to grabbing the brass ring of integrated network and applications management with Optimal Networks Corp.'s recent introduction of the Optimal Networks Tool Kit, a suite of Windows-based applications for LAN and WAN modeling, topology discovery and analysis.

With tools that integrate network management and applications management functions, users can more quickly pinpoint an application that is hogging network bandwidth or, conversely, determine that network bandwidth must be increased to allow a particular application to perform optimally.

The Mountain View, Calif., company's kit includes these new products: Optimal Surveyor, a network topology discovery and analysis tool that utilizes data from Network General Corp. Sniffer network probes; and Optimal Performance 2.0, a new version of the company's network modeling tool. Optimal Performance now allows users to create detailed network models that show not only a network's topology but also its various application-specific traffic flows.

Shortchanged users

Users hailed the capabilities but asked for more. For instance, by using Optimal Surveyor first to import traffic data and then Optimal Performance 2.0 for capacity planning and what-if scenarios, Community Care Network, Inc. in San Diego took "at least 30% less time to create a base topology," said Eligio Rollo, the health care provider's network manager.

But while Optimal's products provide detailed network performance measurements, "it would be nice to collect data from servers, see what bottlenecks are in them and correlate that with what's going on in the network," he said.

Another user pointed to Optimal Surveyor's usefulness in mapping networks and exploring what-if scenarios to evaluate the likely impact of proposed hardware or software changes on a network's efficiency. "Surveyor has been very useful to us in our internet work, where we have had to define [a government organization's] interconnectivity," said Evan Alford, a network architect at Ear Ltd., a government information systems contractor in Ashburn, Va.

Alford said his wish list includes seeing Optimal Surveyor interface with major network management systems. Optimal Networks plans next year to enable its software to interact with Hewlett-Packard Co.'s OpenView network management platform. Similar links to other platforms are planned.

Analysts applauded the products' usefulness in network detective work. When applying the Optimal Networks software to a complex network, "we discovered unexpected traffic flows that were causing performance problems, and we couldn't detect [those problems] in any other way because every element in the network appeared not to be overutilized," said Peter Sevcik, a principal at Northeast Consulting Resources, Inc.

He also noted Optimal Performance's ability to correlate information from multiple sites and let administrators view not only aggregate traffic but the source, path and destination points of multiple, application-specific sessions.

New products from Optimal Networks

Product	Purpose
Optimal Surveyor	For discovery and analysis of multiprotocol network topologies
Optimal Performance 2.0	For modeling LAN/WAN topologies and traffic flows (uses data gathered by Optimal Surveyor)



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ZyLab Corp. has introduced ZyIndex for Internet, a product for publishing paper-based information and existing electronic documents on the World Wide Web.

According to the Gaithersburg, Md., company, ZyIndex for Internet is a Web server that runs Microsoft Corp.'s Windows NT. When connected to the Internet, it lets users on most platforms access full-text indexes (created with ZyLab's ZyImage or ZyIndex) using a variety of common Hypertext Markup Language (HTML) browsers. The product automatically generates HTML, based on the user's query and related document content and includes full-text features.

ZyLab's applications support files in native formats, including word processors, spreadsheets and databases, which let on-line providers share existing full-text databases without prior data duplication or reformatting. The index is updated automatically when information is added or a document changes.

A demonstration of ZyIndex for Internet is available at http://www.zylab.com/.

Pricing for ZyImage for Internet starts at $995.

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Product short

Mustang Software, Inc. has introduced QmodemPro 2.0 for Microsoft Corp.'s Windows 95. It has advanced Telnet features and antomatic password encryption. It lets callers connect to electronic bulletin board systems (BBS) around the world through the Internet. These callers can log on to a BBS through Telnet, rather than dialing their modem to connect. Cost: $129. Mustang Software, Bakersfield, Calif. (805) 873-2500.



Frame relay

CONTINUED FROM PAGE 69

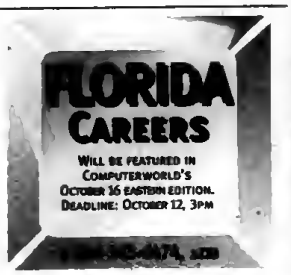
clude the following:

- Voice support lets users who make occasional calls on a frame-relay network save money. This is especially important for international networks, where voice calls can be hugely expensive.
- Fax support means faxes run free over frame-relay networks justified for mainstream data applications.
- SNA over frame relay enables users to save big — 30% to 40% — by tossing out low-speed multidrop private lines widely nsed to support mission-critical data applications.
- Data compression enables users to squeeze up to four times more data onto frame-relay links.
- Higher-speed frame relay would let users support 1.544M bit/sec. plns data transmission.

Challenges include the following:

- Building a more scalable network infrastructure is key to the future of the service, Heckart said.
- So-called Network-to-Network Interfaces (NNI), which enable carriers to interconnect their networks, aren't robust yet. NNIs are critical to the deployment of international frame relay as U.S. carriers link with foreign carrier networks rather than physically extend their networks to other countries.
- Voice support needs to consider the way frame-relay networks work.

"It's not for large users with too much voice or small sites with just a little traffic," said Maribel Howard, a research analyst at International Data Corp., a Framingham, Mass., consulting and research firm.



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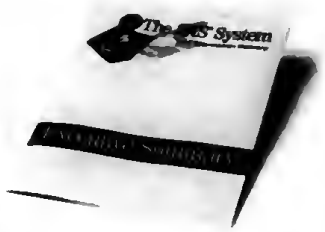
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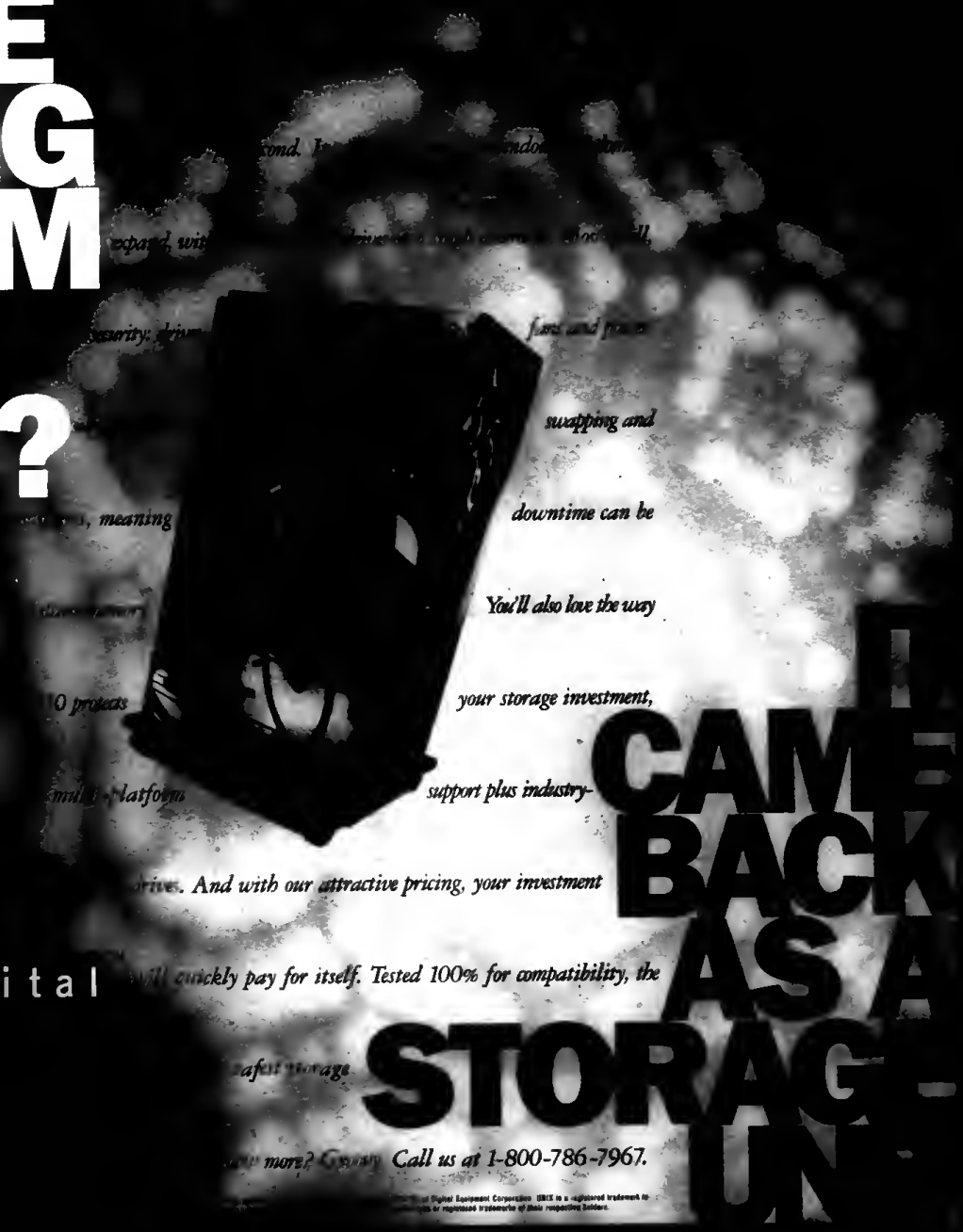
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INTERSOLV TOOL GIVES USERS ONE DATABASE MAPPING LAYER, 88

Large Systems

HARDWARE • SOFTWARE • CORPORATE STRATEGIES

Firms launch software for 'output management'

IBM, Dazel try to curb problems in client/server nets

By Steve Moore

Few computing problems have been more maddeningly persistent than those related to output devices such as printers and fax machines.

End users and systems administrators alike find that difficulties with type fonts, text formats and graphics formats — troublesome enough in mainframe environments — are worse than ever in today's diverse client/server networks.

"The area of printing is very hectic and problematic and has been over the years," said the distributed systems manager at a large Midwestern pharmaceutical firm. Problems may crop up "in less than 2% of your print output, but it's usually the wrong 2%," he said.

The firm currently uses IBM's Printing Systems Manager (PSM) software but will be looking at the new release of Dazel Corp.'s Output Management System as well as other products, the manager said.

Fixing the problems

Output management software aims to increase systems administrators' control of distributed printers, fax machines, pagers and electronic-mail systems.

A crucial operation

Analysts said users often overlook the importance of output management.

"To do cross-platform printing and output management requires as much thought" as any other aspect of a distributed computing environment," said Judith Hurwitz, president of Hurwitz Consulting Group, Inc. in Newton, Mass.

Output management entails many complexities, and "users can't take for granted that if they put in a client/server infrastructure, all the printing and output issues are therefore handled," she explained.

Both IBM's and Dazel's output management applications initially were aimed at large users that have implemented Distributed Computing Environment (DCE) middleware. But Dazel now offers a non-DCE version of its software.

Burlington Northern Santa Fe Corp. in Fort Worth, Texas, chose Dazel's software to handle fax output to dispersed field sites from Mississippi to the West Coast. At Burlington, the "whole network is set up on DCE," said Wally Swanson, manager of network operations center dispatching systems.

Picking and choosing

The railroad "looked at 20 or 30 different faxing solutions" before choosing Dazel's product. It picked Dazel's system because it supports fax, print and pager output and includes application programming interfaces (API), Swanson said.

With the APIs, Burlington's programmers automated the routing and distribution of documents to fax machines in dozens of small towns. This eliminated the need for expensive laser printers and allowed each systems administrator to support multiple sites.

"We are a real-time, seven-by-twenty-four [hour] operation that requires reliability and persistence," he said.

While IBM has the advantage over Dazel in terms of marketing muscle, it would be well advised to move quickly to deal with more than print output or it will leave itself in a precarious position, said Cheryl Currid, president of Currid & Co., a Houston consultancy.

IBM plans to broaden PSM to handle fax, E-mail and pager output initially on a custom basis and by April 1996 with generally available products, according to Kerry Bensman, director of the software business line for IBM Printing Systems Co.

Output management options

Vendor/Product	Function	Platform supported
Dazel Output Management System Software	For managing print, fax, E-mail and paging output functions in distributed computing environments	Unix from AT&T, Hewlett-Packard, IBM and SunSoft
IBM Printing Systems Manager Software	For managing print output functions in distributed computing environments	IBM's RS/6000 under AIX

Systems integrators offer learn-as-you-go training programs

By Julia King

By 1998, 80% of all new applications will be client/server, according to Gartner Group, Inc. estimates.

Client/server retraining, meanwhile, is proceeding at a much slower pace. Last year, only 44% of developers had received any type of client/server training, according to a survey of 50 Fortune 1,000 companies by Forrester Research, Inc.

Now, several systems integrators — mostly small and medium-size boutique firms — are looking to fill this gap with a variety of learn-as-you-go development/training offerings and mentoring programs.



Client/server training

Among them is Cambridge Technology Partners, Inc. (CTP) in Cambridge, Mass., which aims to transfer skills to its clients under its CTP internship program. Typically, internships last six to nine months.

From the beginning

Another of CTP's learn-by-doing strategies is to involve end users from the very start of all integration and development projects. For example, CTP consultants never hold one-on-one meetings with their clients about projects.

"Instead, we always do it as a group exercise — whether the meeting is about business visioning or the look of a certain screen," said CTP President Jim Sims.

That way, a consensus can be reached much earlier in the process. "And that is where all the time-savings comes on these projects," Sims said.

> "As client/server and object-oriented technologies move into the mainstream, there is an upsurge [in demand] for training. Systems integrators are responding by touting expertise transfer as part of their engagements."
>
> — Natasha Krol, Meta Group, Inc.

Another integrator, SHL Systemhouse, Inc. in Toronto, offers a formal mentoring program at a client's request. The firm offers classroom and computer-based training in its project management and development methods.

Under the mentoring program, "we will put in a shadow project team, including a manager of methodology, architects and project managers to shadow a client's managers to get them up to speed," said Jim Hughes, vice president of integration methods at SHL.

New tools

Eventually, Hughes said, SHL is looking to deliver computer-based simulation tools that would enable clients to develop, deploy, test and manage a new client/server application without ever leaving a laboratory environment.

This involves building a series of modules enabled with artificial intelligence and simulation capabilities, a project now under way at SHL. So far, SHL has invested $25 million in such a system, Hughes said.

The basic premise of many of these training programs is that a company's staffers learn better and faster by doing the work themselves.

Consider the case of AT&T Corp.'s Business Communications Services Division, which said it cut a projected four-month development cycle down to two months by placing 16 Cobol programmers in Trecom Business Systems, Inc.'s Star Track program (CW, Oct. 2).

The programmers mission was to migrate a mainframe customer database to a new Unix-based client/server system using Oracle Corp. database technology.

From mid-May through July 1, the programmers attended formal training classes in C++ programming and middleware technology. "Then, on July 1, they started to build the system in earnest, and it was done by Aug. 15," said Fred Manning, district manager for customer account data management at the AT&T unit.

"Our estimate had been Oct. 15," Manning said.

Parallel processing woes discourage some firms

By Michael Goldberg

CHICAGO

It can take a whole village to build a warehouse.

Such projects take money, planning, patience — and help, according to information systems managers setting up parallel processing machines to run data warehouses.

For example, take FedEx Corp. in Memphis. In addition to its in-house staff, FedEx worked extensively with its hardware and database vendors, an outside consultant and database query tool software specialists to build a decision-support system for marketing, said Cynthia Hubard Spangler, vice president of corporate headquarters systems. End users require extensive training, too, she said.

"Even if your hardware and software works well, you're dealing with users who have never been in this environment before. It takes a lot of patience," Spangler said. "Don't tie your pilot project to something that the corporation desperately needs right away."

THE TOP 5 BUSINESS FUNCTIONS FOR PARALLEL PROCESSING

1. MARKETING
2. CUSTOMER SUPPORT
3. SALES
4. ACCOUNTING/ FINANCE
5. PRODUCT DEVELOPMENT

Base: 37 companies planning or considering installing parallel processing in the next two years

Source: Gartner Group, Inc., Stamford, Conn.

Time-saver

The good news: FedEx now calculates in hours what once took days to do. The company uses six IBM ES/9000 mainframes to collect shipment history, along with a 36 processor IBM RS/6000 SP massively parallel model to run queries against a 750G-byte Oracle Corp. database. (In June, IBM renamed its SP2 parallel system; it is now called the RS/6000 SP.)

But while robust processing engines for big tasks are appealing, the complexities involved with symmetrical multiprocessing (SMP) and massively parallel processing (MPP) systems discourage some organizations from embracing the technology, according to consultants at Gartner Group, Inc. in Santa Clara, Calif.

Bruce Love, a research director at Gartner, told attendees at a commercial parallel processing conference here last week that businesses considering decision-support systems using SMP or MPP require high-level managerial support.

Making predictions

Success in data warehouse construction also requires a sense of anticipation about future ways to use the collected records, said Peter Blundell, data design manager at British Airways. The airline started working on its data warehouse in 1990 with a Teradata system and now uses a 44-processor Teradata 3600 model from AT&T Global Information Solutions, along with Oracle software. Its 300 end users mine for marketing nuggets in a 240G-byte data warehouse supported by a 15-member service team.

"You really have to think about what you want to do with your data warehouse," Blundell said.

The uses of such a system can change. British Airways expected on-line transaction processing to dominate the use of its parallel system, but the company has instead found it to be a decision-support tool for marketing, he said. "We see [using the airline's data warehouse] as an opportunity to make better decisions with better information," Blundell said.

Gary Poss, a systems analyst at USAA Information Services in San Antonio, said his company is in the midst of its first pilot decision-support project. It is using a 16-processor Tandem Computers, Inc. Himalaya K20000 server.

Poss said USAA, a health and property insurance firm for retired U.S. military officers, will install its data warehousing project in phases, with the first part to be set up in February.

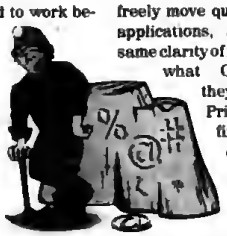
"We'll have a system with a GUI front end so a user can just point and click and join tables for a query. It will make it much easier. They'll be getting information on-line, getting results [that now take weeks] in what could be seconds or even a day," he said.

Intersolv tool lets users get away with one database mapping layer

By Dan Richman

Many tools these days let end users query data by pointing and clicking on plain-English field and column names without knowing where the data is located or how it must be joined.

But until now, a database administrator was required to work behind the scenes to clarify often cryptic field and column names and arrange joining schemes for each tool. The end result of that administrative work is called a semantic mapping layer.



Data mining

Intersolv, Inc. in Rockville, Md., has announced the immediate availability of DataDirect SmartData, a $799 Open Database Connectivity (ODBC) driver that it said will let a single semantic mapping layer work with any ODBC-compliant tool. Previously, database administrators had to develop a semantic mapping layer for each tool.

Defining ODBC

ODBC is a specification from Microsoft Corp. that allows access from any compliant tool to any data source for which a driver has been written.

Thus, with the Intersolv driver, end users can access data with Microsoft's Word today, Trinzic Corp.'s Forest & Trees tomorrow and Excel the day after, always encountering the same field and column names.

DataDirect SmartData is the only product of its kind, said Wayne Eckerson, a senior consultant at Patricia Seybold Group in Boston. Using the new middleware, nontechnical end users at the American Heart Association in Dallas can access an 800M-byte financials database from either Excel or Word.

Furthermore, "this lets users freely move query results among applications, and it offers the same clarity of naming," no matter what ODBC application they are in, said Bob Priestley, manager of finance at the American Heart Association. The association is a beta site for the tool.

Change for the better

Michael diPilato, financial/operations analyst at a Connecticut advertising and promotion company, said his end users are using DataDirect SmartData with Lotus Development Corp.'s 1-2-3 and Microsoft's Access and Excel.

He said the wide range of possible front ends has "made a tremendous change in the way we do business" by eliminating the need to access information with one application and then import it into another.

Both men said Intersolv's support has been solid. However, Priestley complained of persistent delays when setting up the semantic mapping layer, and he said the company has been vague about when the problem will be addressed.

He characterized the delays as "frustrating but workable."

Briefs

Firm introduces session manager

Macro 4, Inc. in Parsippany, N.J., has introduced Version 3.0 of Tubes, a mainframe session manager with new features that include access from a single menu to all applications running on any IBM mainframe operating system, on-line environment or CPU.

Iceberg upgraded

Storage Technology Corp. started general availability on a promised new version of its Iceberg mainframe disk array. The upgraded RAID device supports IBM's Escon fiber-optic interconnect and nearly doubles disk storage capacity to 720G bytes. Iceberg had been limited to 400G bytes of storage. StorageTek in Louisville, Colo., plans to introduce a second mainframe array called Kodiak this month [CW, Sept. 11].

Sterling shines on Unix

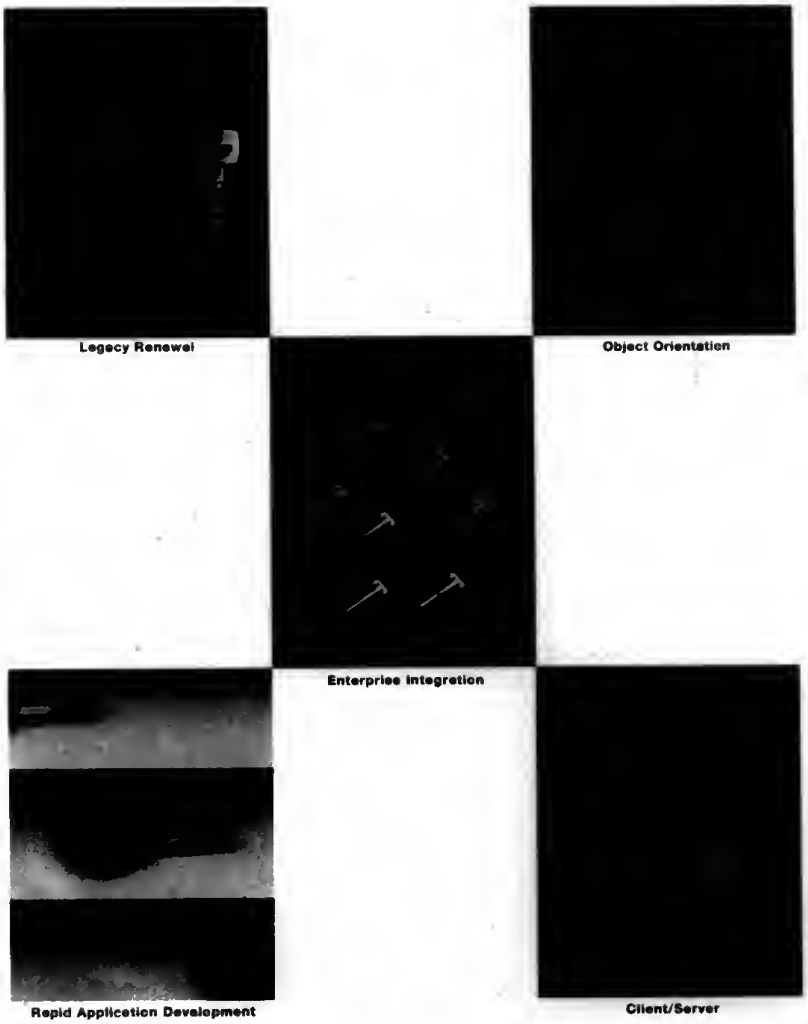
Sterling Software, Inc. has introduced distributed operations management software running on Unix systems. Solver:Commander has agents for collecting feeds from MVS mainframes and SNA networks. Sterling plans to add a TCP/IP agent to gather Unix operations data in mid-1996. The software works with IBM's NetView for AIX and Hewlett-Packard Co.'s OpenView, two of the key network management products on the market.

Electronic forms for all

Business forms provider Wallace Computer Services, Inc. in Hillside, Ill., has introduced an electronic forms software package for IBM mainframe users that books into PC-based forms software from Delrina Corp. Options Forms Framework for MVS lets mainframe users fill, customize, route and print electronic forms and interfaces with database and electronic-mail systems.

What's in a name?

Oracle Corp. has renamed the data analysis products it acquired from Information Resources, Inc. in July. IRI's Express MDB, a data modeling and analysis tool, is now called Express Server, and PC Express (the PC version of Express MDB) became Personal Express. Express View became Express Analyzer, FMS Planner became Financial Analyzer, and DataServer Analyzer became Sales Analyzer.



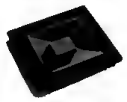
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Digital's NT push belies tri-operating system plan

By Michael Goldberg

It was a Windows NT kind of summer at Digital Equipment Corp. Hardware and software packages designed to run on Microsoft Corp.'s operating system were popping out as if the company's life depended on it.

Lest anyone think they are packing up and moving to Redmond, Wash., Digital officials said they are still committed to three operating systems, with Unix and the proprietary OpenVMS heading up the high end.

By the end of the year, for example, Digital will offer technical and scientific users improved clustering capability for symmetrical multiprocessors running Unix and OpenVMS through a high-speed memory channel. The technology should be ready for commercial server users by the end of February, according to a spokesman.

Terry Shannon, an independent analyst, said Digital Chief Executive Officer Robert Palmer's keynote at the recent Unix Expo '95 in New York underscored the company's attempt to be a long-term Unix force. At the same time, the Maynard, Mass., firm is giving an NT pitch to the market and to old VAX minicomputer users who want new applications.

"They've invested a helluva lot of money in Unix. They've come from the back of the pack in Unix over the past three or four years to running up there with the big dogs" such as Hewlett-Packard Co., IBM and Sun Microsystems, Inc. in terms of functionality, Shannon said. "Digital feels, and rightfully so, that Windows NT is the next, if not the last, major opportunity the company has to gain momentum and market share."

Digital officials from Palmer on down have said they will continue to develop Unix-based AlphaServers while working to increase the company's product line running on Windows NT. For long-time VMS users, NT will be the bridge. It will run on low-end and midrange servers connected to Digital VAX minicomputers.

Since its August announcement of a marketing and technology agreement with Microsoft, Digital has emphasized the following Windows and Windows NT-related products:

- Personal workstations using Pentium or Alpha processors running on Windows NT
- The Windows NT Web AlphaServer for World Wide Web sites
- Workgroup Web, a groupware application for Windows-based PCs
- Workgroup Web Forum, an Internet server application that can support Unix or Windows NT
- A Windows NT version of Polycenter Manager, a NetView management software package

Information systems staffers at ANB Investment Management & Trust Co. in Chicago find they can work well with VMS and NT operating systems, said Mike Schoenberger, second vice president of MIS. The firm uses two clustered AlphaServer 2100s serving several Windows NT and Windows PCs and VAX workstations.

Windows NT systems represent about 10% of Digital's systems business, with Unix at about 45% and growing. OpenVMS makes up the rest and is shrinking, company officials said.

Rich Partridge, an analyst at D. H. Brown & Associates in Fort Chester, N.Y., said Digital's three-pronged operating system strategy "sounds logical and rational if you buy in to that notion that the movement to NT will be rapid. It may be wishful thinking," he said.

Digital also has to watch its Unix flank at the workstation end, Shannon said. Its new "personal workstations" allow users to buy an Intel Corp. Pentium-based machine and upgrade to an Alpha processor using a daughtercard. This shows that higher processing power can be cheaper on NT than Unix.

The Alpha XL running NT with a 233-MHz chip costs roughly $5,500. The same money will buy less than half the clock speed performance on a Digital Unix workstation, Shannon said.

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A. Total number of copies (net press run)	191,722	196,960
B. Paid and/or requested circulation: 1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail subscriptions (paid and/or requested)	162,337	171,371
C. Total paid and/or requested circulation	162,337	171,371
D. Free distribution by mail, carrier or other means: samples, complimentary, and other free copies	26,689	22,992
E. Free distribution outside the mail, carriers or other means	None	None
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G. Total distribution (Sum of C and F)	189,026	194,363
H. Copies not distributed: 1. Office use, left over, unaccounted, spoiled after printing	2,696	2,597
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I certify that the statements made by me above are correct and complete.

Robert Wescott
Distribution Manager

MVS security tool enhanced

By Gary H. Anthes

■ IBM last week began shipping an enhanced version of its venerable MVS mainframe security product, Resource Access Control Facility (RACF).

The enhancements in RACF Version 2.2 make the security tool easier to use and more suited to distributed environments. A key feature is its ability to update multiple, remote RACF databases with a single command without logging on to the remote systems. This helps keep remote databases synchronized, IBM said. RACF 2.2 costs the same as its predecessor.

RACF 2.2 uses the MVS Advanced Program-to-Program Communications function to automatically maintain remote RACF databases. Once the distributed RACF environment is set up, it can be used to implement features such as password synchronization and remote execution of RACF TSO commands, according to IBM.

It also offers an optional utility for automatically removing all occurrences of user identification numbers when a user or user group is removed.

Security product announcements from IBM

Product	Key Features/Enhancements
RACF Version 2.2	Ease of use and administration; support for distributed environments
Internet Connection Secure Network Gateway firewall	Supports AIX 4.1.3; reduced price; IP tunneling; remote administration and alarms
Internet Connection Web clients	Support for OS/2 Warp and Windows; enhancements for security, graphics, audio and performance
AntiVirus software	Support for Windows 95 (available in November)
OS/400 Version 2.3	AS/400 operating system to receive C2 security rating from National Security Agency (available this month)

OSF commitment

IBM said RACF now offers more support for OpenEdition MVS through security checking and auditing for the X/Open Co. Portability Guide Issue 4 standard environments.

"This is IBM's most tangible commitment to date to its membership in the Open Software Foundation," said Robert Campbell, president of Advanced Information Management, Inc. in Woodbridge, Va. "They are essentially saying, 'We are going to bring the mainframe into the distributed computing environment.'"

On the networking front, IBM lowered the price of its firewall security software from $15,000 to $10,000. A new release of Internet Connection Secure Network Gateway with support for AIX 4.1.3 will ship by the end of the month. Support for AIX 4.x releases means the firewall software can run on Powerparallel and RS/6000 systems.

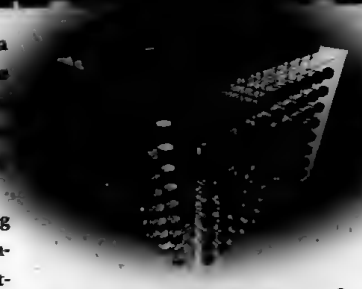
The firewall can establish an encryption-based IP "tunnel" to a firewall on another network, allowing end-to-end confidentiality and authentication within or among companies. These "virtual private networks" can span the Internet and form the basis for secure commerce, Campbell said. Companies are likely to deploy these virtual private networks for electronic data interchange, he added.

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ObjectStar 3.0 lets developers pick their platform, 98
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Wall Street firms are bullish on Next

By Thomas Hoffman
NEW YORK

If you build it, they will come.

The phrase from the Kevin Costner film *Field of Dreams* easily could be Next Computer, Inc.'s mantra in the financial services industry if customer reaction to a recent series of Wall Street seminars is any indication.

Programmers from Merrill Lynch & Co., PaineWebber, Inc. and other investment banks turned out in droves to hear Next Chairman and Chief Executive Officer Steve Jobs hype the company's forthcoming object layers to Microsoft Corp.'s Windows NT and Windows 95 environments (see chart).



Nicholas-Applegate's Duncan Wilcox: *Next is taking logical step toward NT*

Windows NT "is where everyone in capital markets trading is heading, so we're really excited about Next's plans to bring OpenStep in that direction," said Andrew M. Browder, an assistant vice president at Republic National Bank of New York. The bank has been using NextStep for the past 18 months to develop applications on its Sun Microsystems, Inc. and Hewlett-Packard Co. Unix platforms.

"As anti-Microsoft as I am, I realize it's important for Next to address Windows NT and Windows 95," said Duncan Wilcox, director of investment technology at Nicholas-Applegate Capital Management. The San Diego-based portfolio management company has spent the past three years rearchitecting its Windows/Novell, Inc. NetWare front- and back-office environments using NextStep.

Next's Portable Distributed Objects (PDO) technology, an object model framework for building client/server applications, "is at least five years ahead of what anyone else is doing," according to Myles Landstein, vice president of network design and development at Public Interest Network, Inc. The New York-based local and long-distance telecommunications carrier is considering using Next's tools.

Landstein cited PDO's simplicity and its ability to allow "compatible applications to talk to not-so-compatible applications."

Merrill Lynch also is bullish on PDO. It signed an $8 million contract with the Redwood City, Calif., software vendor last month to use a full range of Next tools (CW, Oct. 2). Merrill Lynch plans to use OpenStep and other Next objects to create interoperability among platforms and across multiple geographies.

If Next's systems work as advertised, Merrill Lynch traders running Windows NT workstations in London will be able to share objects with a Merrill Lynch Sun Solaris back office in Chicago and IBM RS/6000-based investors in Los Angeles, according to Michael Mendez, vice president of technology strategy planning at the New York-based brokerage.

Merrill Lynch and other firms also are keen on WebObjects, the object-based World Wide Web development tool kit that Next is expected to ship in the first quarter next year (see chart).

Its future looks bright, but Next is still only a 3-year-old software vendor following an unsuccessful run in the hardware business. Several Next users said the Merrill Lynch contract should help establish Next's viability.

On the horizon

Delivery of Next Computer's object-oriented development kits:

OpenStep for Windows
Alpha – This month
Beta – February
General availability – Q2 1996

Distributed OLE
Beta – Now
Shipping – Q4 1995

WebObjects
Beta – This month
Shipping – Q1 1996

Object? Simplicity

Developers applaud plan to merge OMT, Booch methods

By Frank Hayes

Two major object-oriented development approaches are about to become one. The creators of the Object Modeling Technique (OMT) and Booch object methodologies will announce next week how the two will be merged into a single approach. Their announcement will be made at the OOPSLA (Object-Oriented Programming Systems, Languages and Applications) conference in Austin, Texas.

The unification could simplify choices for developers, who are increasingly turning to the object notations to make sure software will do what users want.

"Going back to the actual users and saying, 'Is this what you meant?' is very effective with this sort of notation," said Michael Axford, manager of systems architecture at U.S. Computer Services, Inc. in Rancho Cordova, Calif.

Imposing duo

Object methodologies break a problem into parts then diagram how the parts will interact. No single object methodology currently predominates but, taken together, the OMT and Booch approaches account for about half of the object-oriented analysis and design tools market, according to International Data Corp. (see chart).

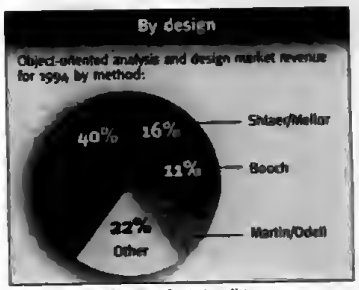
The OMT system was developed by James Rumbaugh and others; the Booch system was developed by Grady Booch. Although Rumbaugh and Booch now work at Rational Software Corp. in Santa Clara, Calif., Rational officials said the company will encourage input from other vendors and users for the unified system that will be unveiled next week.

The firm won't make any attempt to keep the new approach proprietary, officials said.

Users applauded that position.

"It will eliminate a lot of confusion that exists in the market today," said Alan F. Nugent, executive vice president of global strategy and advanced technology at Xerox Corp. in Rochester, N.Y.

Analysis and design systems are generally used for developing application software, but the OMT and Booch systems also can be used for more conventional business analysis, Nugent said.



Source: International Data Corp., Framingham, Mass.

"We're producing object models of our business process and organizational responsibility, describing the roles and responsibilities and collaboration points for organizations and teams and individuals," he said.

As a result, the models can be used to develop large and small applications and analyze business process for possible re-engineering, Nugent said.

[redacted]

Visual Components, Inc. has unveiled Formula One 3.0, an OLE custom control.

According to the Lenexa, Kan., company, Formula One 3.0 is a spreadsheet component for Windows-based application development. It provides compatibility with Microsoft Corp.'s Excel and can create, import and export Excel worksheets. It also supports Excel-style workbooks, including the tabbed worksheet interface and three-dimensional cell references.

Formula One 3.0 features support for events, including Modified, Mousedown, Mouseup, ObjectGotFocus and ObjectValueChanged. It lets users automatically fill worksheet cells with days and dates.

Developers can use Formula One 3.0 in Microsoft's Visual Basic 4.0, Visual C++ 4.0, Access 95 and Visual FoxPro environments, Borland International, Inc.'s Delphi 32 and other environments that were designed to support the OCX component standard.

Pricing for Formula One 3.0 starts at $249 per developer.

▶ *Visual Components*
(913) 599-6500

GammaLink, a subsidiary of Dialogic Corp., has announced the GammaFax Developers Kit for Microsoft Corp.'s Windows NT.

According to the Sunnyvale, Calif., company, the GammaFax Developers Kit gives developers the tools to use GammaLink's single and multiple fax board lines within Windows NT. It lets Windows NT developers choose any of GammaLink's telephony boards to build telephony applications.

The GammaLink fax boards include 14.4K bit/sec. transmission/reception, modified read data compression, dual-tone multifrequency detection and an error-correction mode.

The GammaFax Developers Kit for Windows NT costs $495.

▶ *GammaLink*
(408) 744-1400

ObjectStar 3.0 lets developers pick their platform

By Frank Hayes

One of the few rapid application development environments for mainframes will add PCs to the list of computer platforms it supports. Antares Alliance Group last week said ObjectStar 3.0, the new version of its client/server development system, will support Microsoft Corp.'s Windows 3.1 and Windows NT.

The release, which will begin shipping this month at $8,000 per seat, will let developers create applications on mainframes, Unix servers or PCs. ObjectStar 3.0 will then run the resulting applications on any combination of the three platforms, according to the Dallas company.

At last

ObjectStar users applauded the news. Many of them have been planning for PC support for several years.

"Three years ago, they weren't where we needed to be," said Mary Lou Luhrano, a development manager at Kemper National Insurance Co. in Long Grove, Ill. "They had a mainframe system, and we were looking to place our system into approximately 1,000 agents' offices. But they were heading where we needed to head."

For many corporate development shops, "rapid development on mainframes" is a contradiction in terms. PC-based development environments, such as Microsoft's Visual Basic and Powersoft Corp.'s PowerBuilder, make it easy to develop PC- and LAN-based applications quickly. But there aren't any tools that deal with mainframe code.

Even high-end, client/server development systems that generate code for mainframes — such as IEF/Composer from Texas Instruments, Inc. in Plano, Texas, and SeerHPS from Seer Technologies, Inc. in Cary, N.C. — send developers to PCs or Unix workstations to do their work.

Client/server systems

ObjectStar 3.0 lets developers work on a mainframe if they choose, users said.

"One of the big things we liked is that you could develop the stuff on the IBM mainframe and then port it to another platform," said Dennis Roseth, director of corporate information systems at Rexnord Corp. in Indianapolis. The company manufactures industrial power transmission components.

Rexnord first used ObjectStar to build a system that would track employee time and attendance, Roseth said.

The application had to integrate with other mainframe-based applications and implement complex incentives required by the shop-floor employees' union contract. That last requirement meant it would cost far more to customize a packaged system than to build the employee-tracking application from scratch using ObjectStar, Roseth said.

Different method

Key to ObjectStar's ability to speed up the mainframe development process is its rules-based development approach. Developers identify business rules that are then stored in tables.

The rules can be stored on any of the platforms ObjectStar supports; the system uses its own communication middleware to connect the distributed components.

That approach makes a huge difference for mainframe shops that want to move toward client/server systems, said Brant Russell, manager of IS at Pacific Telecom, Inc. in Vancouver, Wash.

"We needed something that would be easy to use and learn, but it also had to integrate with our existing environment because we weren't going to throw away our billion-dollar investment in code," Russell said, ticking off his list of requirements.

"So it had to run against our legacy data structures as well as integrate with [the] Cobol environment. It also had to be interoperable across multiple environments, including PCs," he said. "And if we were going to make a change, it had to increase productivity by a factor of three over our Cobol development."

Even more important to developers than quickness is the ability to shift maintenance tasks from IS to business users, Luhrano said.

"We've actually taken our business people, who don't have a technical background, and trained them on the tool," she said.

"The majority of our maintenance for this system is in updating tables. So instead of making code changes, the users can go in and update the business rules and table values. From a maintenance point of view, that's a hefty benefit."

High-end client/server development systems

▶ IEF/Composer
Texas Instruments, Inc.
Plano, Texas
(800) 336-5236
Platforms: mainframe, VMS, Unix, PC

▶ SeerHPS
Seer Technologies, Inc.
Cary, N.C.
(919) 380-5000
Platforms: mainframe, AS/400, Unix, PC

▶ ObjectStar 3.0
Antares Alliance Group
Dallas
(214) 447-5500
Platforms: mainframe, Unix, PC

▶ Forte
Forte Software, Inc.
Oakland, Calif.
(510) 869-3400
Platforms: VMS, Unix, PC, Macintosh

▶ Dynasty
Dynasty Technologies, Inc.
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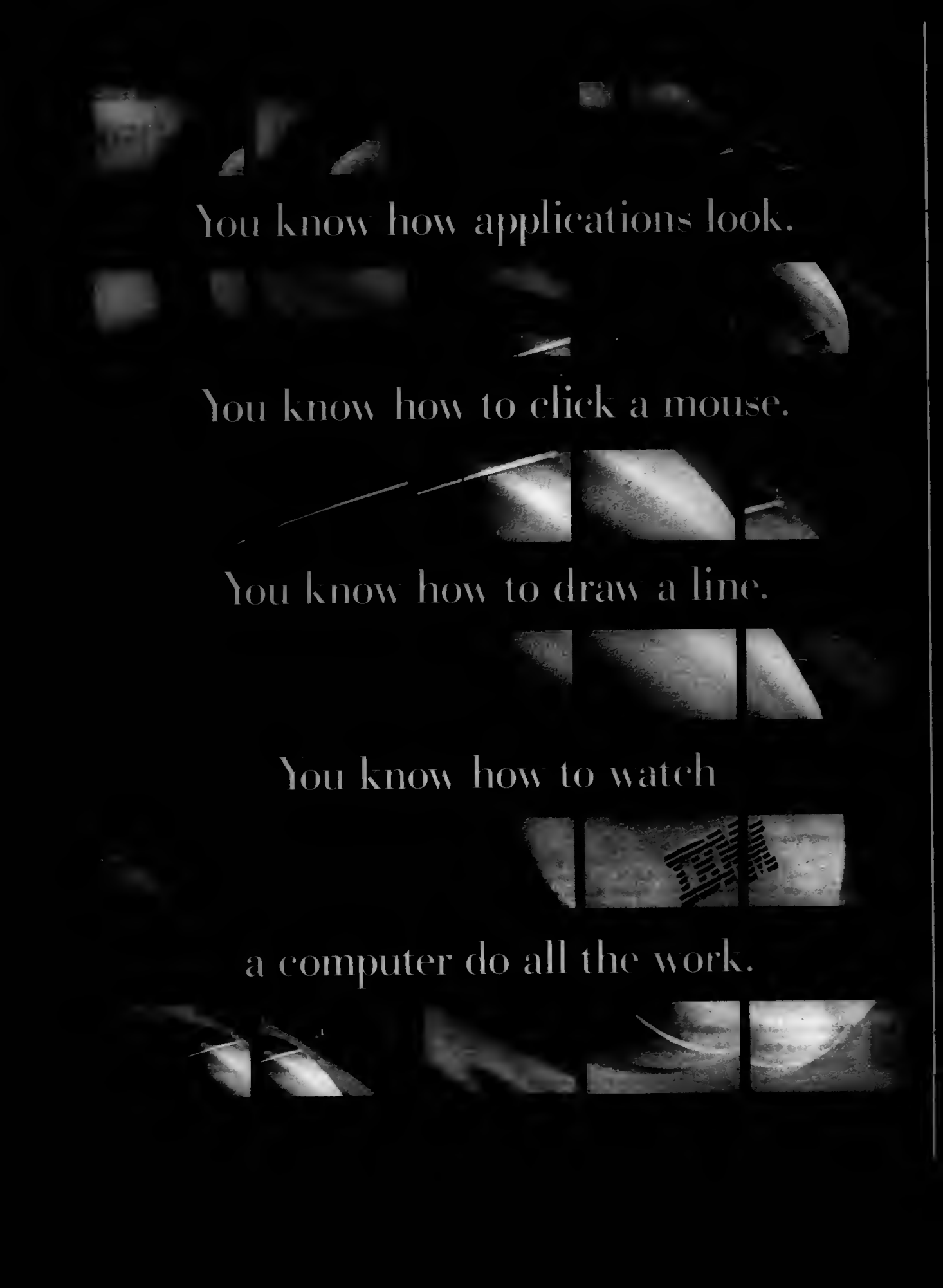


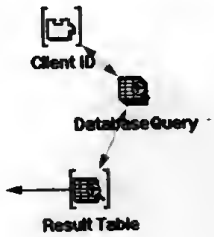
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Essbase stretches range of compatibility

By Dan Richman

Arbor Software Corp. last week announced that its Essbase multidimensional server will work with four additional front ends, giving users a wider choice of tools using that product's online analytical processing capabilities.

Applix Spreadsheets, a 32-bit spreadsheet from Applix, Inc. in Westboro, Mass., can access Essbase data in the version that recently began shipping.

Andyne Computing Ltd. in Kingston, Ontario, will ship an Apple Computer, Inc. Mac OS version of its Pablo end-user query tool by next July.

Advanced Visual Systems in Waltham, Mass., is expected to ship a version of its Express 3D visualization tool that runs against Essbase by this time, too.

And Scotts Valley, Calif.-based Borland International, Inc. has released object class libraries and visual controls that let developers create Essbase applications using Delphi, a client/server development tool.

Prototypes of all four products will be demonstrated at Arbor's first international user conference, which convenes Oct. 16 in San Francisco, said Marguerite Padovani, a spokeswoman for the Sunnyvale, Calif., company.

One user said the new features were good news.

"That's great about all those products, but we're really excited about Pablo," said Nerissa Chang, senior information systems applications manager at Bay Networks, Inc., a Santa Clara, Calif., networking vendor.

"Pablo is useful alone, but applying different levels of security for different users and different queries is difficult," Chang said. "When we put it on top of Essbase, we think those problems will go away."



Briefs

Metadata warehousing

R&O, Inc. in Westford, Mass., last week said it has opened its Rochade metadata repository to three other vendors' warehousing products. Interfaces are available immediately for Directory Manager 2.0, a tool for understanding and navigating metadata from **Prism Solutions, Inc.** in Sunnyvale, Calif.; Key for Enterprise, a set of application development tools from **Sterling Software, Inc.** in Dallas; and ARIS-Toolset, a business process re-engineering tool set from **IDS/Prof. Scheer, Inc.** in Saarbrucken, Germany.

3-D data tool announced

Advanced Visual Systems, Inc. (AVS) has introduced a new version of a tool that converts data into three-dimensional representations. The tool, AVS/Express V2, was designed to help user firms develop applications for data mining and on-line analytical processing. **J. P. Morgan & Co.**, a banking firm, is using AVS/Express in a 3-D application that tracks mortgage prepayments and defaults shown on a map of the U.S., according to AVS. AVS/Express runs under Microsoft Corp.'s Windows 95 and Windows NT and various versions of Unix. Prices start at $18,000.

Bank picks Sybase

The **National Australia Bank** has selected **Sybase, Inc.** as the standard database management system for its client/server rollout. The strategy also includes applications written in Powersoft Corp.'s PowerBuilder running on Sun Microsystems, Inc. servers with a mix of Sun and PC clients.

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VISIONTEK™

Management

Jump-start your IS teams with these tips from team leaders and experts

By Kathleen Melymuka

FAST TEAMS FOR FAST

BACK IN THE MID-1980s, Dan Ono noticed that some AT&T information systems teams were having trouble getting off to a fast start. Team members were racing around in an unstructured way, wasting precious time.

"There's always pressure to fast-start so you can finish on time and meet the deadline," says Ono, national project director at AT&T Global Business Communications Systems in San Francisco. "But once into the project, everyone realizes they all started in different places and went in different directions. Then you have to stop, get everybody lined up and going in the same direction."

That's easier said than done. The leisurely white-water rafting trips and weekend war games that used to make team alignment fun mostly are things of the past. Few companies have the money, and no one has the time.

Today's team members come together for short-term projects, disband at deadline and join with new members for the next project. They have to dispatch issues of logistics, organization, politics, expertise and personality with a speed undreamed of in previous corporate collaborations.

What do you do to get IS teams off to a fast, effective start? We asked project managers and consultants and found they've developed many techniques — and some surprising tricks — to launch IS teams. Here, in their own words, are their tips.

Plan and conquer

"We developed the Project Take-Off Workshop. The duration varies: A new team may take three days, a team with previous experience may take a day and a half.

"The team starts with a formal, internal meeting. We want to ensure that we all understand the scope of the work and the characteristics of the project. This includes how it differs from other projects, the budgets and the political considerations.



"At the internal kickoff meeting, all functional group leaders work on constructing a 'work breakdown structure.'

"We build a responsibility matrix. This details each task and who has responsibility for it. We also make a schedule, align objectives and solicit the concerns of the functional units and assign them to people to resolve.

"A few days later we schedule a half-day kickoff meeting with the client. That lets us hear their concerns. And it gets their buy-in to the plan. Because we've already been through it all, the AT&T team is already in sync, and we don't step on each other's toes. Now we're ready to start."

DAN ONO
National project director
AT&T Global Business Communications Systems
San Francisco

Getting to know you

"A coach has to add value to the team and not lengthen any process. In the same period of time, you have to take a more global approach.



"We have a coach on our network inventory management system team that had had his own mentor. He worked with the team on a small application first. This let the team get to know him. Then when the team moved on to the larger project, the coach was well known. He helped the team work on a conversion of data from several systems to a new one. He helped the team think through the process — think about the whole thing they needed to do. And he helped the team build a framework to convert from all different sources to the new source.

"Left on their own, that team would have dealt with it one system at a time."

CHERYL GLIDEWELL
Director,
information resource management,
software development services
Sprint Corp
Overland, Kan.

Don't get dumped on

"Don't have businesspeople doing strategy planning and then dumping it on [IS]. Some development people and data management people should be included in the process so you get the flow of information.

"One of our groups is working with the long-distance finance department. They want to know where they need to be in the future as far as system development. And they need to develop a migration strategy for how to get there.

"We know how to code, but we need to do analysis and design to know what to code. If we know the business problems, we can ask ourselves: Does this design allow them to get this done?



"They get a better feel for the business problems. When they actually get the [migration] assignment, they have a much clearer perspective. It gives them a real jump start."

CLOENE GOLDSBOROUGH
Senior director,
information resource management
Sprint
Overland, Kan.

Inside

CALENDAR, *page 108*

TIMES



Courtesy Kinesis

A real stick-to-it approach

"We use a sticky-note process. We ask for fairly high-level tasks from everybody involved in a project. We write these on Post-It Notes.

"Then we get together in a room with a facilitator. We use the notes to build the project out on a wall. We flesh it out. We expand the list of things to do. We might have 10 or 15 people in the room, but it's actually quicker than to do it piecemeal. As the discussion gets going, we assign responsibility for the pieces on the sticky notes with a relative time line.



"We move the notes around to develop dependencies. For example, 'If you're going to do that, here's what you'll need to have first.' It's very visual. Everyone can see you have to do this before you can do that.

"After one meeting we had 300 sticky notes. We used them to put together a plan with the facilitator's help. It's time-consuming, but once you're through it, you have a pretty good process. And, it's been put together by the people who will have to do it."

JERRY FILLER
Group manager
Progressive Corp.
Mayfield, Ohio

Teach cats and dogs to cooperate

"I put a group of people together with a problem to solve. I included test engineers and developers, who are historically are at each other's throats. They lacked the experience individually to solve the problem. But I told them, 'Don't come out until you're done.'

"The engineers and developers will fail on their own, so they have to talk to each other. I love watching it."

Now or later

"The fastest and highest quality way to get a product done is to follow a rigorous design process, but people don't think they have the time."

Bradley once managed a project that had floundered for six months. He insisted on taking time to train developers on how to do very detailed analysis and design. Coding finally began nine months into the project.



"People were very nervous, but the functional design document drove the coding phase so effectively that we completed development on deadline."

KIT BRADLEY
Software engineering manager
Spectra-Physics Scanning Systems
Eugene, Ore.

Clear the air

"There's tremendous value in getting the methodology down. To do that, have a strong manager with a good vision of how everything should flow. But they've got to be right.



"For example, in a very large project for a defense contractor, the manager specified an approach for detail design that didn't make any sense. The team just quit work.

"Let people air their views in the beginning, before decisions are made. If there are differences of opinion on how to proceed, talk them out. Get people to really understand the other person's perspective. It tends to get out some really good ideas.

"Then, when you nail down agreements on methodologies, people who might have preferred a different way will at least have had their say at the beginning. It's like having a vote and agreeing to follow the laws once they're passed."

CHARLES MARTIN
Vice president
Manufacturing Consulting Partners, Inc.
Concord, Mass.

Build a clubhouse

"All IS teams really do need a space where they can get all their requirement documents out, do all the interim stuff, deal with questions that haven't been resolved. They need to have the space available to them all the time. They need to be able to put charts up and keep them up.

"I had a team build their own clubhouse. We started with a space with dividers and junk in the middle. We asked ourselves how to make this our clubhouse — a place where people are really going to work. We got them actively involved in making their own space. They scrounged phones, got tables, moved junk, found an electronic whiteboard, a PC, a trash basket.

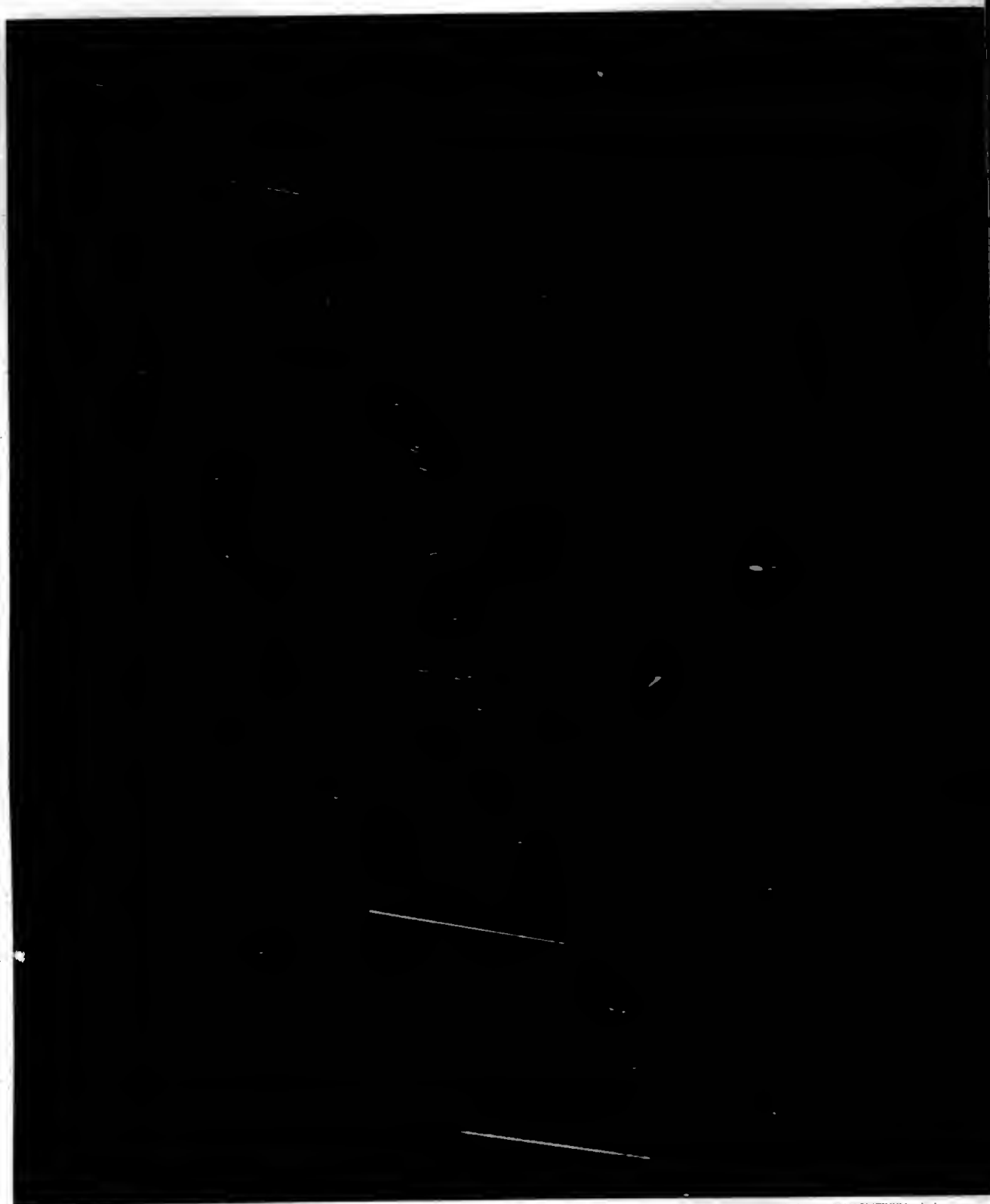


"We built a space out of nothing. It didn't cost the company anything. We had constant battles with the furniture police, and that brought people together."

Two words: Have fun

"Laugh. Make this fun so people want to be there."

NORM KERTH
Consultant
Elite Systems
Portland, Ore.



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PLATINUM TECHNOLOGY

Calendar

OCT. 22 · OCT. 26

MANAGEMENT

SIM Annual Conference: The Right Circle for IT Leadership. Orlando, Fla., **Oct. 22-25** — Speakers include: F. Warren McFarlan, professor of business administration, Harvard University; John Landry, chief technology officer, Lotus Development Corp.; Ingvar Petursson, vice president and chief information officer, McCaw Cellular Communications, Inc.; Gerald Prothro, vice president and CIO, IBM; and Skip Savoia, vice president, Computer Sciences Corp. Conference highlights include CIO Portfolio, a personal and professional assessment workshop for CIOs and senior executives to benchmark their experience and performance. Contact: Society for Information Management (SIM), Chicago, Ill. (312) 644-6610.

TeamNet Workshops. Boston, **Oct. 24-25** — Focus is on mastering skills for starting and maintaining teams. Contact: The Networking Institute, Inc., West Newton, Mass. (617) 965-3340.

INDUSTRIES

Health Care and Pharmaceutical Opportunities on the Internet. Washington, **Oct. 23-24** — Topics include: telemedicine on the Internet, interactive clinical education on-line, creating a World Wide Web site for clinicians and legal restrictions on the promotion of pharmaceutical products and services on the Internet. Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

Advanced Systems and Technologies for Property and Casualty Insurance. New Orleans, **Oct. 24-25** — Topics include: developing standards to efficiently move toward client/server technology; repositioning a company for maximum profitability through integration of technology and business process re-engineering; integrating legacy systems, packages and in-house-developed technology in both mainframe and client/server setups; and approaching project management with object-oriented development techniques. Contact: Global Business Research Ltd., New York, N.Y. (212) 645-4226.

USER GROUPS

Open Media Framework (OMF) Interchange International Developers Conference. Colorado Springs, **Oct. 23-26** — Focus is on the digital post-production process and how customers can effectively interchange projects by using OMF-compatible products and applications. Contact: Ariana Wallack, Schwartz Communications, Inc., Wellesley, Mass. (617) 431-0770.

TECHNOLOGIES

Commerce At Light Speed (CALS) Expo International '95. Long Beach, Calif., **Oct. 23-26** — Theme: "Changing the Future." Focus is on developments and trends in electronic commerce technologies, processes and standards used in the integration of multicompany and multinational enterprises. Keynote is by Norihiko Ishiguro, director of information at the Computer and Communications Policy Office of Japan's Ministry of International Trade and Industry. Fees: industry, $695; government, $575. Contact: CALS Expo International, Irvine, Calif. (714) 855-1419.

Second Annual Strategic Multimedia Conference. San Francisco, **Oct. 23-24** — Focus is on "digital convergence" and its impact on multimedia, market size and distribution; product opportunities for hardware, software, systems and services; and emerging legal issues facing developers, publishers and distributors of multimedia products. Contact: Frost & Sullivan, New York, N.Y. (212) 964-7000.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

SEND ENTRIES TO:

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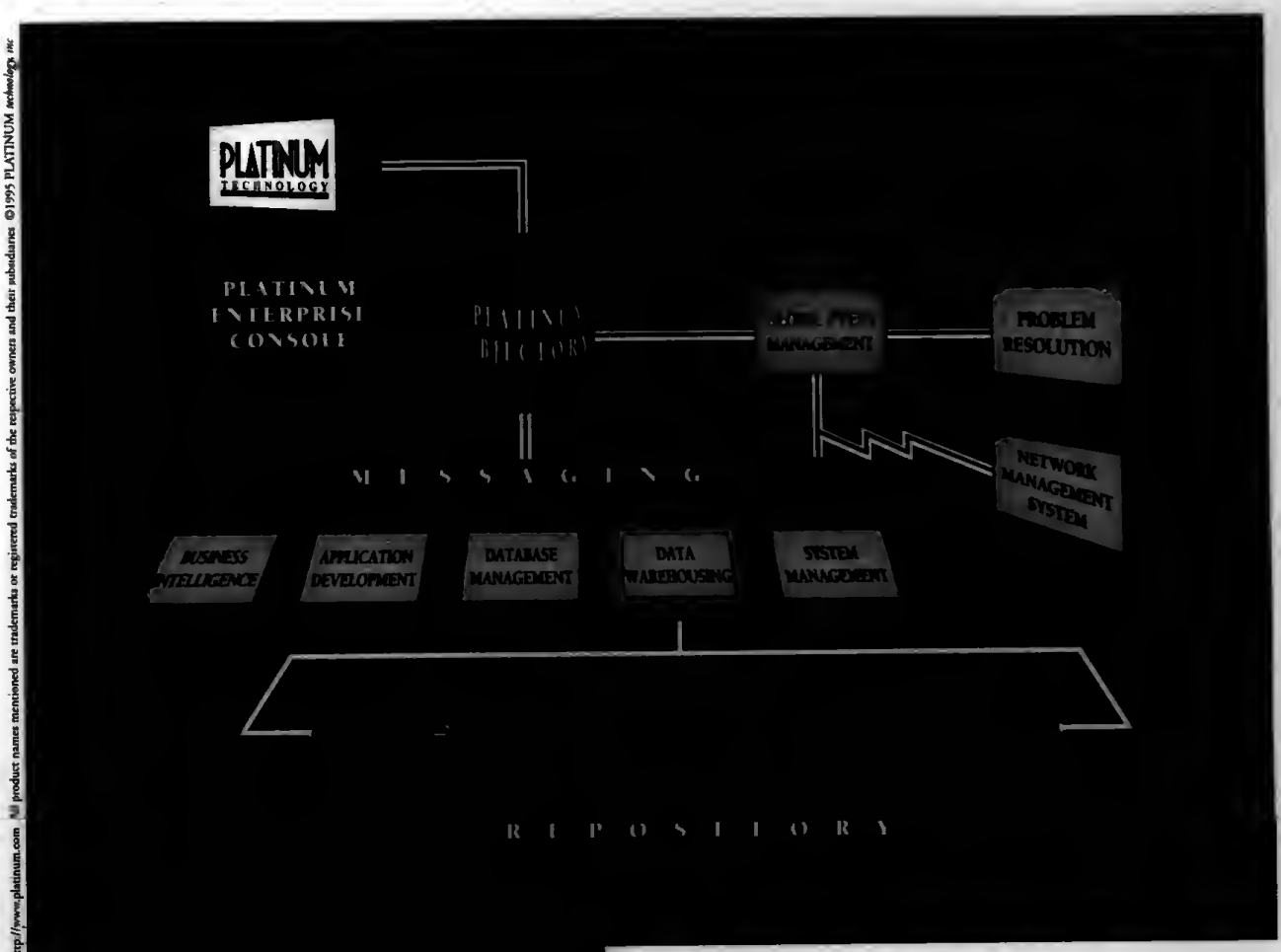
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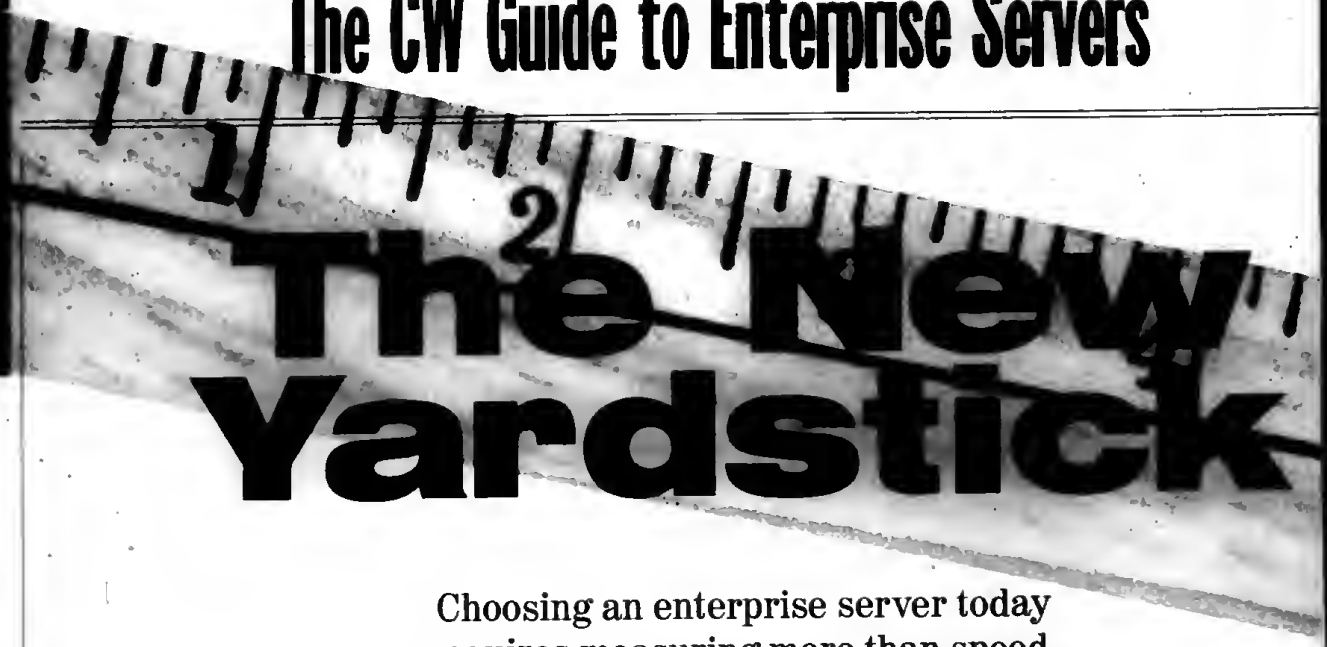
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The CW Guide to Enterprise Servers



The New Yardstick

Choosing an enterprise server today requires measuring more than speed. Buyers must factor in price/performance, architecture and vendor viability.

By Avery L. Jenkins

Whetstones, dhrystones, MIPS and MFLOPS — these were once the yardsticks against which computing hardware could be measured. But in the complex enterprisewide client/server systems of today, these benchmarks have just about gone the way of the ancient cubit measurement.

Today, information systems managers look at a whole set of criteria when purchasing an enterprise-class server, or one that is designed to host multidepartmental applications. Raw CPU speed plays only a small role, if any at all.

Those buyers look at high-end Unix servers and traditional minicomputer and mainframe processors repositioned for a client/server environment to handle these applications.

Meta Group, Inc., a consultancy in Stamford, Conn., recommends basing server selection on four areas: technology and architecture, price/performance, any unique requirements the user may have and commercial presence of the vendor.

TECHNOLOGY AND ARCHITECTURE

The best way to determine whether a server's architecture will meet your needs is to immerse it in your environment.

This is the approach Ford Motor Co.'s advanced vehicle technology division took. It evaluates all server contenders by putting the hardware into a model of Ford's real-world computer-aided engineering (CAE) environment, according to Howard Crabb, director of advanced CAE methods and processes.

"What we have found is if you take a look at a system, hreak it np into these pieces and optimize only one of those ... the system probably won't work. And if it does, it won't be optimized," he says.

So, "we actually hring machines in and try them out as part of the system to see how they operate in this paradigm," Crahh says. "In addition to the hardware, we are also looking at the software — does the machine with the software get accurate, quick results?"

This was the approach Ford employed before it made its most recent purchase, a Convex Computer Corp. server.

PRICE AND PERFORMANCE

When it comes to the enterprise, the key to solving the price/performance equation rests in uncovering the true performance of a system. Experts in the area agree that truth is a slippery notion in determining large server performance.

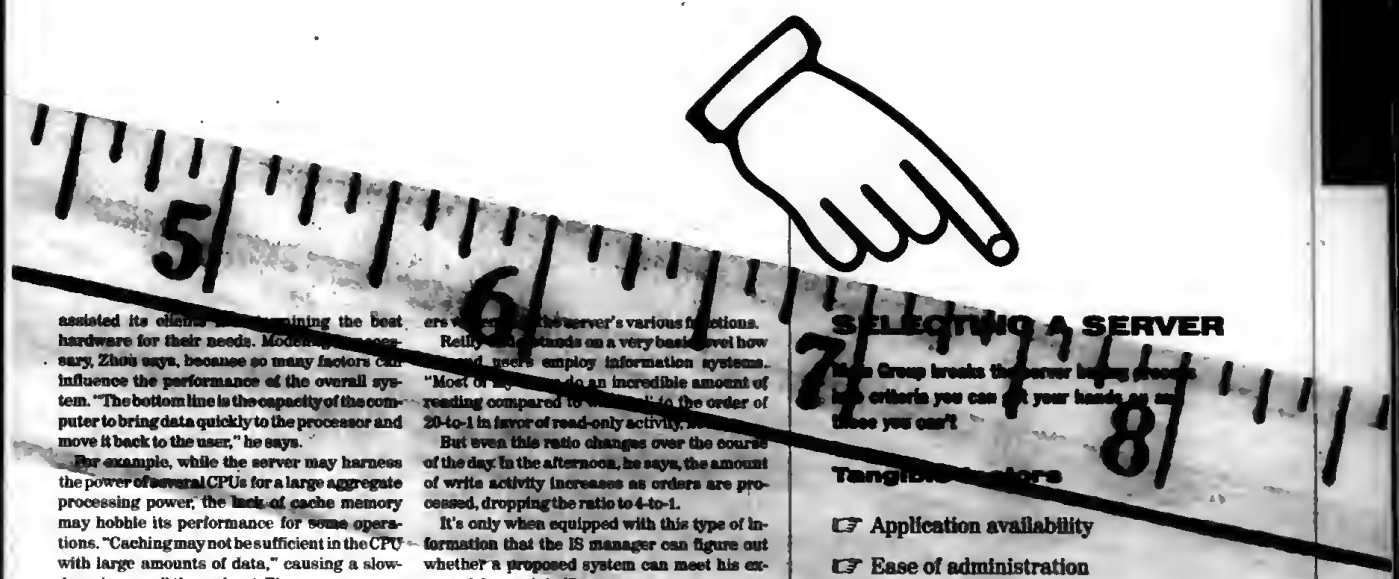
"Having worked for a vendor years ago, I know that benchmark numbers are always optimized to put your best foot forward," says Chuck Lasky, an independent technology consultant in Shelton, Conn. "You really have to see it with your own eyes."

Lasky says he remembers the days "long ago, when computers were housed on raised floors, and customers would lift up the floor panels to see if the cables were connected to what the vendor said they were connected to."

Instead of standardized benchmarks, companies today are likely to look at customized assessment methodologies that incorporate system architecture as well as speed. These home-brewed or special-purpose benchmarks are often combined with full-system modeling techniques when IS managers evaluate large systems, says Songnian Zhou, president of Platform Computing in Newbury, Mass.

Zhou's company develops software for clustered multiprocessing server systems and has

▶ Users rate their satisfaction on large-scale server products from Hewlett-Packard, Digital and Sun Microsystems. Buyers' Scorecard, page 114.



assisted its clients in determining the best hardware for their needs. Modeling is necessary, Zhou says, because so many factors can influence the performance of the overall system. "The bottom line is the capacity of the computer to bring data quickly to the processor and move it back to the user," he says.

For example, while the server may harness the power of several CPUs for a large aggregate processing power, the lack of cache memory may hobble its performance for some operations. "Caching may not be sufficient in the CPU with large amounts of data," causing a slowdown in overall throughput, Zhou says.

The best way to choose a large-scale server is to be very cautious, Lasky says. Compared with distributed or departmental servers, "you have to start thinking about the same things you thought about with a mainframe because now you have all your marbles in one basket," he says.

UNIQUE REQUIREMENTS

This type of multidimensional approach is being adopted by companies that increasingly value the hardware's fit into a unique environment more than raw power.

Take the case of Richardson Electronics in LaFox, Ill. Kevin Reilly, vice president of IS at the $100 million company, agrees that performance was only a small part of the equation for his company's decision to purchase a Data General Corp. Aviion server.

"We are getting to a point where they are all fast enough," he says. What matters to him is end-user satisfaction: whether the hardware, software and network combined can meet the business requirements of his staff.

Reilly's applications aren't highly unusual — he employs the Aviion server to support manufacturing resource planning, sales support and accounting functions — but the environment is. Reilly's applications are built around the Pick database engine.

For those reasons, he says, "we had someone come in and create a benchmark to use because we didn't think the standard benchmarks would work" for the company's special situation. "Most benchmarks deal with a standard database and a certain suite of activities."

Purchasing a server that will mesh well with the existing environment requires an intimate understanding of how applications and end users [illegible] the server's various functions.

Reilly [illegible] stands on a very basic level how [illegible] users employ information systems. "Most of [illegible] do an incredible amount of reading compared to [illegible] to the order of 20-to-1 in favor of read-only activity, [illegible]

But even this ratio changes over the course of the day. In the afternoon, he says, the amount of write activity increases as orders are processed, dropping the ratio to 4-to-1.

It's only when equipped with this type of information that the IS manager can figure out whether a proposed system can meet his expected demand, Reilly says.

COMMERCIAL PRESENCE

Often, a company will choose a vendor not because the vendor's architecture or performance fulfills a specific need but because the vendor has important alliances with others in the market.

For example, Rhon-Poulenc-Rorer, a pharmaceuticals manufacturer in Collegeville, Pa., virtually ignored CPU speed when it picked a server for its data warehouse applications. Looking at IBM, Sequent Computer Systems, Inc. and Digital Equipment Corp. offerings, "we assumed that the speed would be the same for all of the vendors," says Jeffrey Lawler, a systems engineer at the company.

Rhon-Poulenc-Rorer chose Digital's Alpha server because of Digital's close alliance with Oracle Corp. and the hardware vendor's willingness to help out on the software end.

"We were looking for a partner that was willing to take on some amount of risk," Lawler says. He adds, "Digital was willing to partner with us with structuring the database and getting the application up and running."

Frequently, the commercial presence of a vendor translates into the level of support that a user can expect to receive. To Reilly, support means the hardware vendor "can be a single point of contact," regardless of where the problem may occur. "If I can get Oracle support through my vendor, then that's nice," he says.

Reilly adds that a hardware vendor with a good working relationship with the major software companies is more likely to get good software support than his firm would as a little $2 billion company. ■

Jenkins is a freelance writer in Ansonia, Conn.

SELECTING A SERVER

[illegible] Group breaks the server buying decision [illegible] criteria you can get your hands on and those you can't.

Tangible factors

- ☞ Application availability
- ☞ Ease of administration
- ☞ Ease of programming
- ☞ Expandability
- ☞ Memory subsystem scalability
- ☞ Large physical memory
- ☞ Price/performance
- ☞ Raw performance
- ☞ Reliability
- ☞ High-availability features

Intangible factors

- ☞ Ability to influence vendor's future products
- ☞ Compatibility with existing environment
- ☞ Customer's relative importance to the vendor
- ☞ Future product line enhancements
- ☞ Investment protection features
- ☞ Prospects of a beneficial long-term relationship
- ☞ Reputation
- ☞ Service and support reputation

Users' evaluations

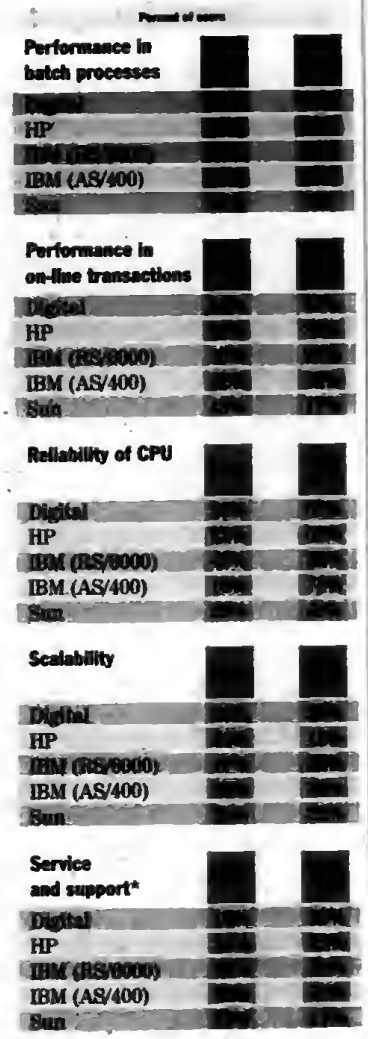
Computerworld *asked users to rate their large-scale servers*

Digital Equipment Corp.
Maynard, Mass. (508) 493-5111
DEC 7000 Model 700
DEC 8200 and 8400
(41 users surveyed)

Hewlett-Packard Co.
Palo Alto, Calif. (415) 857-1501
HP 9000 Series 800
(50 users surveyed)

IBM
Armonk, NY (914) 765-1900
RS/6000 Power server
AS/400 9406
(53 users surveyed)

Sun Microsystems Computer Corp.
Mountain View, Calif. (415) 960-1300
SPARCcenter 2000
(35 users surveyed)



*Average of nine separate support categories

BUYERS SATISFACTION SCORECARD

DEC servers grab performance ratings

By Kevin Burden

Users say they want reliability, scalability and support from their server vendors. But suppose you find a product line that delivers those factors and also doubles — even triples — CPU speed. Suddenly, speed has your attention.

The line of servers that is turning heads is from the comeback kid of the computer industry, Digital Equipment Corp. Digital's systems — the 7000 AXP, 8200 5/300 and 8400 5/300 — appear to be holding the fancy of those who use them. The satisfaction level of its users in key categories often exceeded that of users of competing systems.

Computerworld hired First Market Research in Austin, Texas, to survey users on their satisfaction with their current large-scale server. The vendors and servers included the Digital systems, Hewlett-Packard Co.'s HP 9000 Series 800, IBM's RS/6000 and AS/400 and Sun Microsystems Computer Corp.'s SPARCcenter 2000.

What we did...

To find out how high-end servers are meeting users' needs and expectations, Computerworld hired First Market Research in Austin, Texas, to survey a minimum of 30 users of each vendor's server.

The percentages in the charts represent users who rated their product either "good" or "very good." Most of the remaining users awarded "average" scores.

Performance

An astounding 81% of the Digital users contacted gave their systems favorable marks for performance in both on-line transaction processing and batch processing.

As fast as the 7000 AXP is with its 21064A processor, the newer 8200 and 8400 "blow it away," according to one user. The 8000s are based on Digital's more advanced 21164 Alpha chip, the first chip designed to break the 1 billion instructions-per-second barrier. They also have architectures redesigned for high-end symmetrical multiprocessing (SMP).

"We compared it to other alternatives, and not one was able to beat [Alpha's] response time," one 8200 user says.

In benchmarks, the Alpha systems can make the competition look miserable. According to a report from Dataquest, Inc. in San Jose, Calif., the AlphaServer 8400 more than tripled the SPECint benchmark rating of the HP 9000-800 T500 and the IBM RS/6000 cluster system, and it doubled the maximum performance of Sun's SPARCcenter 2000E series in integer processing.

Reliability of CPU

Users still turn to midrange systems such as the AS/400 because of their reputation for reliability. Nearly three quarters of AS/400 users surveyed gave CPU reliability the highest rating they could. The other systems had respectable reliability ratings; well over half their users awarded them favorable marks. But none had as many users willing to give a "very good" rating as the AS/400.

In related questions on operating system and memory reliability, more AS/400 users awarded their machine the highest grade possible than users of any of the Unix servers. "Most operating systems are not perfect, but the OS/400 is virtually bug-free and thoroughly tested by IBM," one user says.

Digital and HP made the best showing for CPU reliability among the Unix servers. Users said it is a considerable accomplishment for Digital's new architecture to win the confidence of so many customers. "It's extremely stable. We haven't had a single minute of downtime," says Arnold Delarisch, information systems coordinator at Florida Atlantic University in Boca Raton.

Scalability

Most users contacted were more than content with their architecture's expansion options. More than half of the users of each system said scalability was either good or very good. The exception was the RS/6000, which received such marks from just 45% of its users. While the RS/6000 had fewer users awarding positive marks, the majority that did gave scalability the highest grade they could.

In scalability, just as in the performance category, Digital users were the most satisfied. Nearly 40% of its users gave scalability "very good" ratings. Many using the 7000 AXP cited its 64-bit architecture as the key to its expansion. The 7000 AXP can also be upgraded to the 8400 without changing the chassis. The move from an 8200 to an 8400 requires a box-swap upgrade.

HP users were satisfied with their servers' scalability, but they weren't overjoyed. HP had the most users who said scalability was good but had the fewest offering "very good" ratings. The HP 9000 T500 scales from one to 12 PA 7150 CPU chips in an SMP architecture. HP says the T500 series will be board-upgradable to future advanced PA-RISC chips, such as the PA 8000, which should be available by the middle of next year.

As for Sun, a little more than half its users gave the SPARCcenter favorable ratings. Nearly half rated scalability only "average." "It scales to eight CPUs well; beyond eight is questionable," says Byron Baker, a database analyst at Sprint Corp. in Rancho Cordova, Calif.

Service and support

Because vendor support means many things (telephone, on-site, troubleshooting, warranty) and user response needs aren't all created equal (general inquiries and emergency calls), the percentages in the chart at left represent the average of how users scored nine different support categories.

Each vendor showed particular strengths. IBM's RS/6000 and AS/400 scored better than the competition in terms of emergency support.

All users were happier with the emergency support from their vendor than they were with their vendor's attentiveness to general inquiries. "I don't mean to cry wolf all the time, but it works," one Sun user says. An IBM user says, "They know what emergency means; the difference in response is quite noticeable."

Digital was strong in most categories. Users particularly gave it high grades for support staff knowledge and access to appropriate support members.

HP's ratings were solid in all categories, though none stand out as superior or inferior to those of the competition.

Sun's support showed more weaknesses than strengths; its best asset was the knowledge of its support staff; its most blatant weakness was telephone support — barely 20% of users could say anything good about it. ■

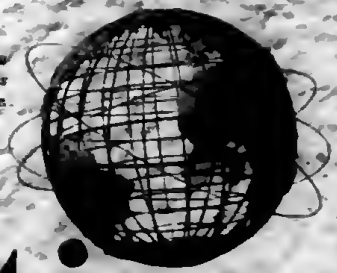
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THE INFORMATION MANAGEMENT COMPANY

CMOS cuts cost, boosts power

By Kevin Burden

IBM's System/390, 9672 Parallel Enterprise Servers — the vendor's family of air-cooled, CMOS-based mainframes — are attracting users because of the power they offer as well as the power they don't use.

The power-saving aspect drove Mead Corp. to the 9672. The Dayton, Ohio-based information services company is trying to reduce its computing costs by offloading a portion of the work from its IBM 3090-600Js and IBM 9121-570s to two S/390s, a 9672-R41 and a 9672-R61.

"Our cost for the 3090 is about $40,000 a month," says Jim Nicholas, manager of enterprise systems support. Nicholas says 23% of the $40,000 is just for power. He estimates that switching from the water-cooled 3090 to air-cooled processors will cut power consumption by at least 80%.

Nippondenso America, Inc. in Southfield, Mich., needed a more scalable computing platform. Its computer-aided design applications had outgrown its IBM 4381 host, and the lease was up on that machine. "It was time to move to a more powerful system," says Ken Tsuzuki, executive engineer at the company. Nippondenso's choice was a 9672-R21 running MVS/ESA.

CMOS chip technology — with low power consumption and low heat generation — gives the 9672 several advantages over traditional bipolar systems. CMOS is cheaper to produce, which means lower hardware costs for users, and it's air-cooled, which saves users the cost of chilling water.

Installation

"Installation is a breeze," one evaluator says. Both users say the S/390 easily hooked up to existing peripherals such as IBM's RAMAC disk arrays. The only software obstacle was trying to get extra licenses from software vendors.

"I've seen the good and the bad in my 20 years in systems administration. This system is definitely on the good side," Nicholas says. "We're using the same software and peripherals we used on our 3090 with no conflicts."

Mead installed IBM's Escon channels with its R61. Escon allows fiber-optic connectivity between devices up to 39 miles away. "Escon is how we intend to cut down on the cabling and costs," Nicholas says of the high-bandwidth cable scheme.

Performance

Mead prepared for a decrease in performance. It was forewarned by IBM that its six-processor S/390-R61 was slower than the six-processor 3090-600J's engine the S/390 was replacing. "We didn't expect [the S/390-R61] to be as fast, and it wasn't," Nicholas says. But the move to Escon made up some of the difference because accessing data over fiber boosted performance to acceptable levels, he says.

Mead sacrificed a processor when it replaced a five-processor IBM 9121-570 with a four-processor S/390-R41. Although the 9121 is faster, "no one notices the difference," Nicholas says.

Nippondenso's two-processor S/390-R21 with Escon was a major step up from its 4381. "It's much faster than what we had. Better performance with less overhead," Tsuzuki says.

Scalability

In July, IBM added two 9672 model classes, the R2 and the R3. These models can be upgraded from the original R1 models and can contain up to 10 microprocessor-based engines. Up to 32 machines can be coupled into a Parallel Sysplex system where the resources of all systems act as though the system was a single machine. Both users are confident they will be able to expand their systems to support future needs.

Mead plans to upgrade its 10-month-old R1 models to R2 or R3 machines next year. It will use IBM's Enterprise Server Option, a technology upgrade program that helps users change technology levels at a relatively low cost. "When we upgrade to the faster technology, we will get rid of our 3090 and save more money," Nicholas says.

Systems management

The S/390's "hardware management console is overkill for just a single system, but its graphical screen is a godsend compared to the old green screen," Nicholas says. One console can display real-time vital signs of up to 32 S/390 machines. "We can monitor CPU utilization and channel status on the same screen. We couldn't do that" with the 4381, Tsuzuki says.

Cost

Nothing about the 9672 is more attractive than its cost, according to users. Both users praised its performance and scalability, but they said its cost — both for purchase and maintenance — was its best feature.

The inherent efficiency of CMOS technology means S/390s consume less power than bipolar machines. S/390s don't need water chillers and occupy less than one-tenth the floor space required by a 3090-600J. "Our decision was driven by cost," Nicholas says.

For Nippondenso, the S/390 also means less heat and less floor space. "We're saving a lot of money on air conditioning alone," Tsuzuki says. ■

Burden is *Computerworld*'s senior researcher, Firing Line/Scorecard.

IBM System/390 9672 Parallel Enterprise Server

Computerworld asked two users to grade their 9672 on a five-point scale in which A equals "very good," C equals "average" and E equals "very poor." (Grades are the average of the two users.)

Installation — **A** Neither user reported conflicts with existing peripherals or applications

Performance — **A-** Users liked its performance. It wasn't on a par with the mainframes they were used to, but Escon made up some of the slack.

Scalability — **B** All models can be upgraded to newer models, and users liked the Parallel Sysplex as the high-end option.

Systems management — **B+** No more green screens. Users liked the multiple vital signs on one screen but said the Hardware Management Console was overkill for just one system.

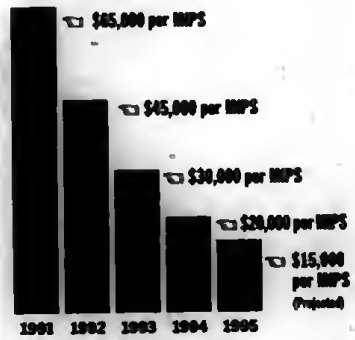
Cost — **A+** The real reason they bought it. The efficiency of CMOS makes the 9672 relatively cheap to buy and own.

For more information, call IBM at (800) 426-2255, or check out its Web page at http://www.s390.ibm.com.

DOWNWARD SPIRAL

The price per MIPS on traditional mainframes has decreased more than 30% per year for the past two years and is projected to continue for the foreseeable future

Average selling prices for new IBM systems in the U.S.



Source: Gartner Group, Inc.

UNIX CAN COST MORE

The typical Unix server may cost $6,000 to $7,000 per MIPS now, but it's not exactly fair to compare those estimates with price per MIPS on traditional mainframes.

Comparing functionality, especially in terms of true cost of ownership, is quite likely a more important metric. Studies from Gartner Group, Inc. have shown that since the late 1980s, the cost of owning a server-based system is at least as high or higher than owning a traditional mainframe. For example, Unix servers may be surrounded by a much bigger support staff. There's also significantly higher end-user involvement, which means big money.

Advice to buyers? Platform cost should be the least significant criterion. Make decisions based on requirements of the applications first.

Source: Charlie Burns, director of research, large computer strategies, Gartner Group, Inc.

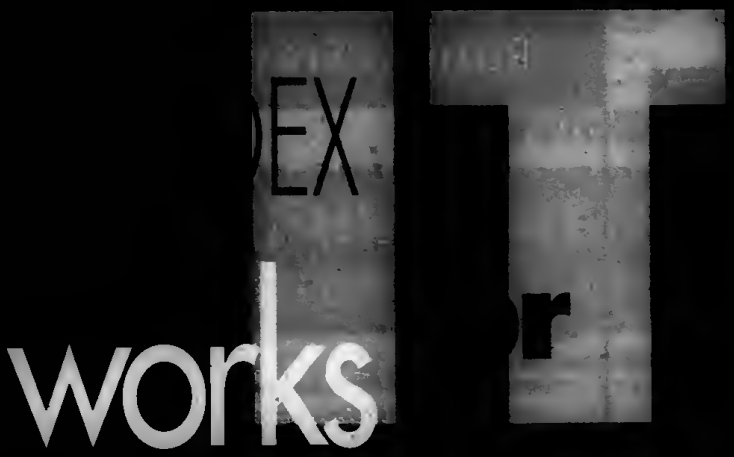
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- 0.5 micron CMOS processors.
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- 64-bit architecture.
- Fast on-chip system buses for efficient SMP.
- Hardware-level support for Microsoft Corp.'s Windows NT.

Source: Datapro Information Services Group

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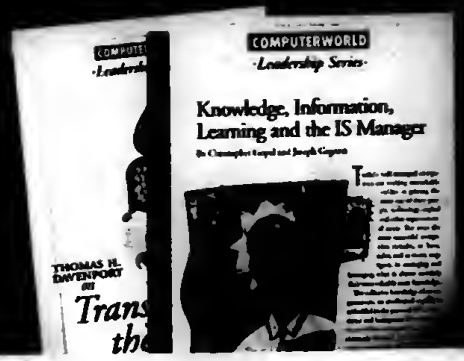
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Few CIOs are measuring the performance of their IS departments and, therefore, are not managing to the best of their ability, says this month's Leadership Series author, Howard Rubin. Only 20% of all CIOs know the size of their information systems asset base, and fewer than 3% know how much that base changes annually. One consequence is the CEO-CIO disconnect that exists when the business value of technology investments can't be expressed quantitatively. The solution, says Rubin, is a measurement flight deck that connects IT with business objectives.

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(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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Sizing up the players

HP, IBM, Compaq servers get the nod from Forrester

By James M. Connolly

Microprocessors are commodity items, and operating systems are pretty well standardized. So how can Forrester Research, Inc. narrow the enterprise server vendors to three?

Part of the answer rests in the fact that standardized hardware and software help a vendor pass only the first test in becoming what the Cambridge, Mass., consultancy calls a high-performance partner.

Hewlett-Packard Co., IBM and Compaq Computer Corp. came out ahead of the pack, according to Forrester analyst Jon Oltsik.

BUYERS' CHECKLIST

Some of the elements Forrester Research advises that buyers look for when server shopping

Level 1

- **Standards** (NetWare, Unix or Windows NT; Intel or PowerPC chips; symmetrical multiprocessing)

Level 2

- **Volume** (At least 10% market share)
- **Technology** (Integration, systems management, reliability)
- **Vision** (Vendor is stable and innovating in client/server)
- **Global support and distribution**

Examining 14 individual server vendors, plus the varied Intel Corp. clone vendors as a single, 15th category, Forrester ranked vendors by their ability to provide servers both at the enterprise and workgroup levels.

The first cut:

One of Forrester's first efforts was to define standards that best serve users. Oltsik notes that some of the vendors who failed to make the grade as general-purpose server providers could be well suited for some applications and that the advantage of one technology over another could be minimal. "These technology quabblings are totally unproductive. We have to stop the infighting over which technology is better," he says.

With that in mind, Forrester chose Unix, Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT as software platforms; the Intel and IBM/Motorola, Inc. PowerPC as processors; and symmetrical multiprocessing (SMP) as a key feature for scalability. That first cut eliminated Sun Microsystems, Inc., Stratus Computer, Inc., Tandem Computers, Inc., Silicon Graphics, Inc. and Cray Research, Inc.

The second cut:

Forrester then evaluated vendors on whether they were volume producers that demand the attention of software suppliers. Analysts also looked at the vendors' integration of their technology, financial strength, understanding of corporate needs, global presence and vision. "Who is pushing client/server technology? Who is trying to make client/server win rather than going in kicking and screaming late in the game? Who is innovating?" Oltsik asks.

Vendors that fell out of competition at the second level were ranked either as long shots or wild cards. Data General Corp., Unisys Corp. and Sequent Computer Systems, Inc. are ranked as long shots; Pyramid Technology Corp. and the Intel clone makers — which stand to benefit from Intel's plan to make the upcoming P6 chip a natural platform for SMP servers — are on the cusp between long shot and wild card. AT&T Global Information Solutions, which was rated as a wild card when the report was issued, has since been downgraded to a long shot because of cutbacks. Digital Equipment Corp. ranks as a wild card, although Forrester urges the company to give up its fight to compete with its Alpha chips and to focus on the Intel architecture.

The chosen ones:

That left IBM, Compaq and HP in the top ranks, with HP getting Oltsik's top grade.

His comments on those three are as follows:

HP: "They have a real nice product suite from the PC servers all the way up to the enterprise servers." He says HP has the technology, systems management tools and integration that large corporations need.

Compaq: Strengthened by the commercial acceptance of the Intel architecture and NT, it is "the only PC vendor you see out there doing deals with SAP and doing deals with Oracle," says Oltsik, noting that Compaq has started to understand corporate users the way HP and IBM do. This is in part through its partnerships with integrators such as Electronic Data Systems Corp.

IBM: Featuring a "great breadth of products" and a good understanding of tying together diverse technologies, IBM has to be wary of confusing the customer with its varied product groups. ■

Connolly is editor of technical evaluations/CW Guide.

Inch by inch, the mainframe's role evolves

By Max Hopper

Is the mainframe an endangered species? Information systems opinions range from "not yet" to "not anymore." Those who believe in the latter wryly suggest that mainframes are digital dinosaurs already removed from the imperiled technologies list by extinction.

Those most loyal to large systems say there remains a legitimate role for the mainframe in core business applications with large transaction volumes or huge throughput needs. They contend that networked small systems offerings can't yet be scaled up to fill this role as reliably or as cost-effectively. Mainframe advocates say it makes no sense to buy, train and harness a dozen sled dogs to pull their load when they already do it with a single horse — a proven workhorse that is paid for.

"But you're beating a dead horse," say others who have hitched their IS wagons to newer, more vibrant technologies. "You're living in an expensive, archaic, dead-end past. Whatever we spend on our so-called sled dogs is an investment in the future. It's a future of open operating systems, scalable architectures, interoperability, portable applications and robust development tools."



Max Hopper

Most companies steer a middle course. By minimizing investments in new MVS applications, they have essentially disconnected the mainframe's life support system. Their strategy is to let the big boxes expire naturally as applications become outmoded and are replaced with more modern technology.

Ironically, few have done less to ensure the preservation of this species than those with the greatest stake in its survival — mainframe vendors. Now that's changing. As IBM and other vendors release scalable mainframes with parallel processing architectures based on CMOS technology, large companies have a fresh alternative. These systems offer capacity beyond that of the largest mainframes and should be cost-competitive with smaller servers attempting to scale up to comparable performance.

The biggest news, though, is next year's release of an open systems version of MVS. It will offer mainframe users the interoperability that makes Unix and Microsoft's Windows NT such compelling alternatives while retaining the reliability and manageability necessary for large-scale, mission-critical applications. Will this makeover produce the survival traits mainframes need to function cooperatively in environments far different from the one they once dominated? Can we learn to view mainframes as simply the largest scale of server in a multitiered network architecture? Even if an open version of MVS renders the mainframe receptive to the give and take of the client/server world, other technical issues must be solved before it can assume full citizenship.

We still need network tools that bridge a multitiered architecture to distribute processing functions among clients and various levels of servers. And it remains to be seen whether the robust development tools, relational databases and applications of today's server world will scale up to provide the same capabilities in the mainframe domain.

In deciding the fate of the mainframe, the only relevant issue should be whether it represents the most appropriate technology answer for a certain class of business information needs. And for those who need its capabilities, there is arguably more reason to consider the mainframe today than at any time since we've had a choice of platforms. ■

Hopper is president of Max Hopper & Associates, a consultancy in Dallas.

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By Joseph Maglitta

Graveyard shift

Unseen and unsung, late-night IS workers struggle against fatigue, career uncertainty and lack of good take-out food so that processing nightmares don't see the light of day



After dark, The New England's windowless data center becomes its own world. "You can feel very isolated," says 12-year night veteran David Gately (above)

ALL PHOTOS BY JOHN SOARES

CONTINUED FROM COVER 1

"At night, there are not as many people to please," explains Sheehan, who works the late shift. "You can do high-volume, high-quality work."

Adds coworker Richard Cully, 33: "You can take things at your own pace." A contract worker who says he hopes to start a home-based business, Cully commutes 20 miles after dark from suburban Framingham. "Traffic is a breeze," he says.

Others laud the freedom to take day courses, the higher pay, the greater independence and the three-day work weeks.

Nationally, 93,000 of 625,000 full-time computer operators work the night shift, according to the latest available figures from the Bureau of Labor Statistics.

Firefighter's hours

From the moment Rich Paulousky squeaks across the empty marble lobby dressed in jeans, T-shirt and sneakers, it's clear the evening atmosphere and The New England's usual blue-blooded formality are as different as, well, night and day.

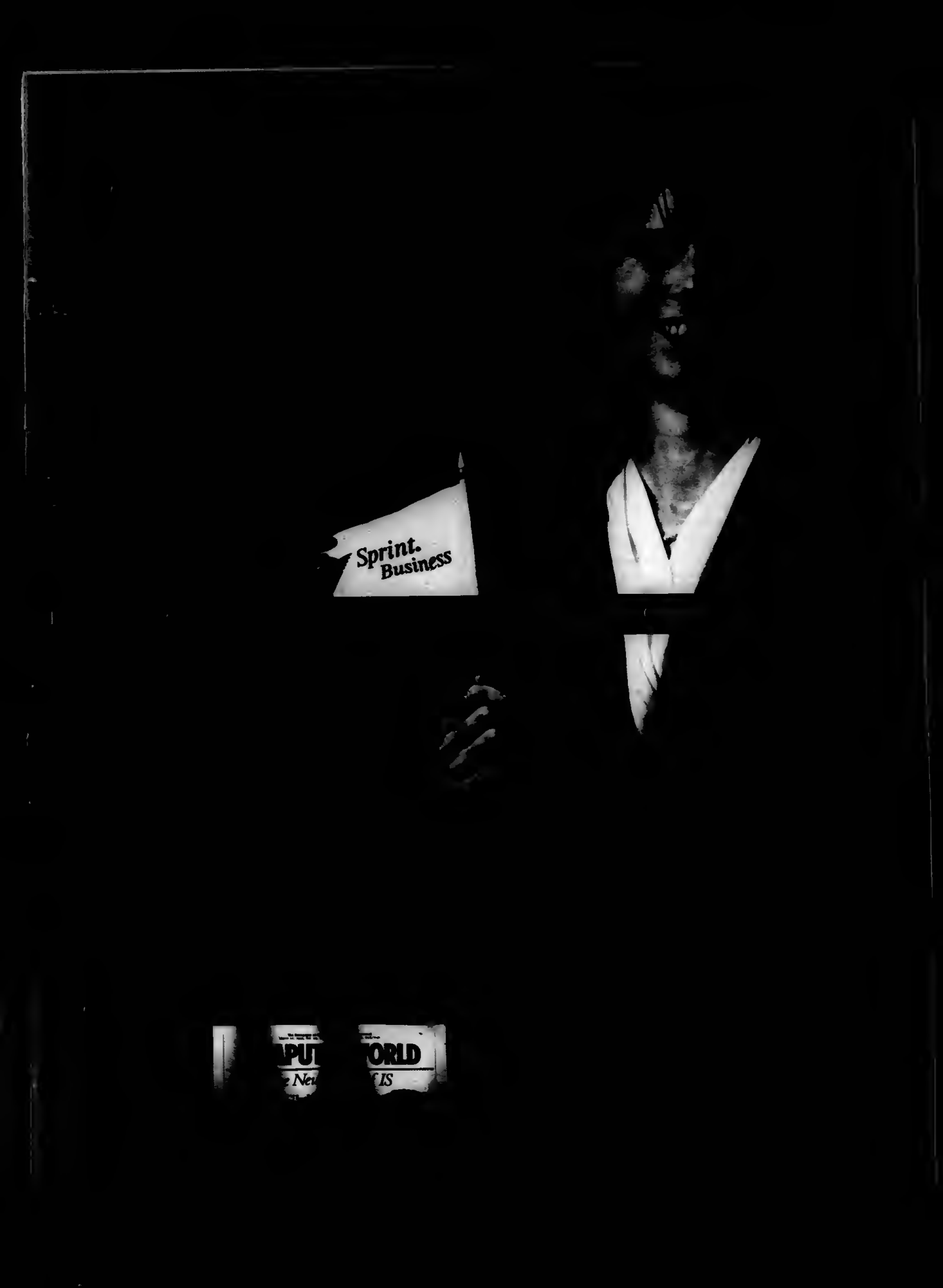
"Things are more relaxed at night," says Paulousky, night manager of computer operations. The 160-year-old firm occupies a 10-story limestone-and-granite edifice that takes up an entire block in Boston's fashionable Back Bay neighborhood. Its 24-by-7 data center at 501 Boylston St. never sleeps.

At a steel desk in the modest third-floor office he shares with the day supervisor, Paulousky runs down a rhythm more familiar to firefighters than IS staffers.

"Three days on, four days off. We work 12½

Graveyard shift, *page 128*




Sprint.
Business

Graveyard shift

CONTINUED FROM PAGE 123

hour shifts. You get a week off every eight weeks," he says.

As the only evening supervisor, Paulousky oversees nightly chores that include updating 50 databases, printing reports and running batch processing for company offices in 50 states.

All night jobs must be completed on the shift to make way for the real-time processing and application development that dominate the company's IBM 3090/500J during normal business hours. "You don't want the system going down in the daytime," when it can disrupt thousands of users as well as The New England's commercial service business, Paulousky says. For that reason, any equipment problems must be fixed before dawn.

Yet even this veteran nightowl — Paulousky joined the firm in 1973 after learning data processing in the Army — says late hours can seem unnatural. "You can't keep your eyes open sometimes," he says. On many mornings, Paulousky, 43, goes straight home to bed after work.

"You can't keep your eyes open sometimes."
Rich Paulousky

Night work can slow career

Other workers say they've adapted but tell of feeling distanced from family and day workers.

"You can feel very isolated from the rest of the company, especially when you're applying for another job," says David Gately, 32, a senior computer operations specialist who's worked nights in the data center for 12 years. "If everything goes right, people don't know you're here."

It's a common feeling. Hardly the most high-profile crew to begin with, data center staffers become all but invisible after dark. And that, workers say, makes it difficult to gain the recognition needed to land day jobs in other areas.

Paulousky says he believes upper management knows what the crews are doing. Even so, he agrees that "the exposure isn't quite there."

Career-wise, "there's no place to go," adds Jim Rabideau, a senior computer operations specialist with five years of night work.

Indeed, the total number of data center jobs has frozen at 50, including 17 at night. The hiring freeze has iced chances for internal advancement. And there's little chance to learn new technology; other than some basic monitoring, operations workers are not involved with the client/server and Internet equipment now showing up in the data center.

The low profile is OK for some, such as Geraldo Rodriguez, 33, a senior computer operations specialist. An eight-year night veteran, Rodriguez says he welcomes the chance to work in peace. "The less noticed we are, the better."

Anonymity isn't total, though. The group's boss, Mitch Bendzans, second vice president of IS, works days. But staffers say he never misses a chance to note their hidden labors to top brass. "We do a lot of benchmarking to make sure our price/performance stacks up against — and exceeds — Andersen and EDS and the other outsourcers," Bendzans says.

Like most, Rabideau has mixed feelings about night work. He likes that on off-days he can golf and spend time coaching Little League. "But my wife's not crazy about it," says Rabideau, 36, whose children are 14, 12 and 2.

As supervisor, Paulousky, who is divorced, has it better than most. Every Monday he attends day meetings with IS leaders. E-mail also helps keep him in touch. Nevertheless, he misses the bonding rituals of business life, like the annual golf outing and picnic.

Indeed, small comforts taken for granted by day workers seem more precious at night — such as fresh, hot food. Even in Boston, a city of 575,000, finding a restaurant open at 2 a.m. is all but impossible. The New England's cafeteria is closed at night. Surprisingly, there is no coffee machine, collecting money was too big a headache.

Even smoking is a hassle. Night puffers must journey to a deserted subbasement for a cigarette.

To ease such stings, The New England pays night workers a 13% differential over their daytime counterparts. (Computer operators and technicians average $25,000 to $35,000 a year, according to *Computerworld*'s latest salary survey.)

For those who want it, there's the opportunity for "daylighting."

Take Wayne Reid, for example. The jovial 38-year-old computer technician works a day job as a $17-an-hour construction worker. When does he sleep? Reid laughs.

At 4 a.m., the print and control rooms are bustling. If the mainframe is dead in corporate America, word hasn't reached here. The

Graveyard shift, *page 128*



Drama after dark

Shows operational problems [illegible] at any moment.

[illegible] episode of [illegible]

Computer operations specialist Geraldo Rodriguez works on a mainframe console [illegible]

11:36 p.m.

Drive 579 is not responding. The Storage Technology Corp. Model 4411 tape robot threw an hour earlier while resuming a 400-megabyte tape cartridge. Operations manager Rich Paulousky peers into one of his console's two dozen monitors.

In bright red letters, the message blares:

JCL ERROR
LOOKING FOR INPUT
CODE 6B37

Paulousky explains that the command is stuck in the IBM 3090/500J CPU. It's poor timing; the team is beginning to process end-of-month transactions tonight. Seated at the console, senior operations specialist David Gately hunches over a phone. He's been talking with the StorageTek support line for nearly an hour. Attempts to interrupt the offending command with JCL commands from the master console fail.

In a few moments, Paulousky leaves to physically check the problem drive again. "This is a tough one," he says.

12:30 a.m.

The decision is made to call in the local StorageTek field engineer.

"We don't want to shut down the whole system and reboot," Paulousky explains, munching a submarine sandwich in his office. "That's like pulling out the whole engine to replace a bad spark plug."

He wipes his mouth and heads back to the glass house.

1:10 a.m.

"Looks like it's starting to proliferate," Paulousky says over the air conditioner hum. Gately and senior computer operations specialist Geraldo Rodriguez lean forward to see.

"Look. It's starting to slow up the rest of the drives," Paulousky says.

Soon, drives 578, 57A and 579 freeze. One-fifth of The New England's 20 cartridge units are now down. If the system isn't running at full speed by 4 a.m., Paulousky says, monthly processing will fall behind schedule.

Drama after dark, page 128

11:30 PM
Firm's working late on big project.
Network's humming along.

11:31 PM
Weird sounds from printer
interrupt your bliss.

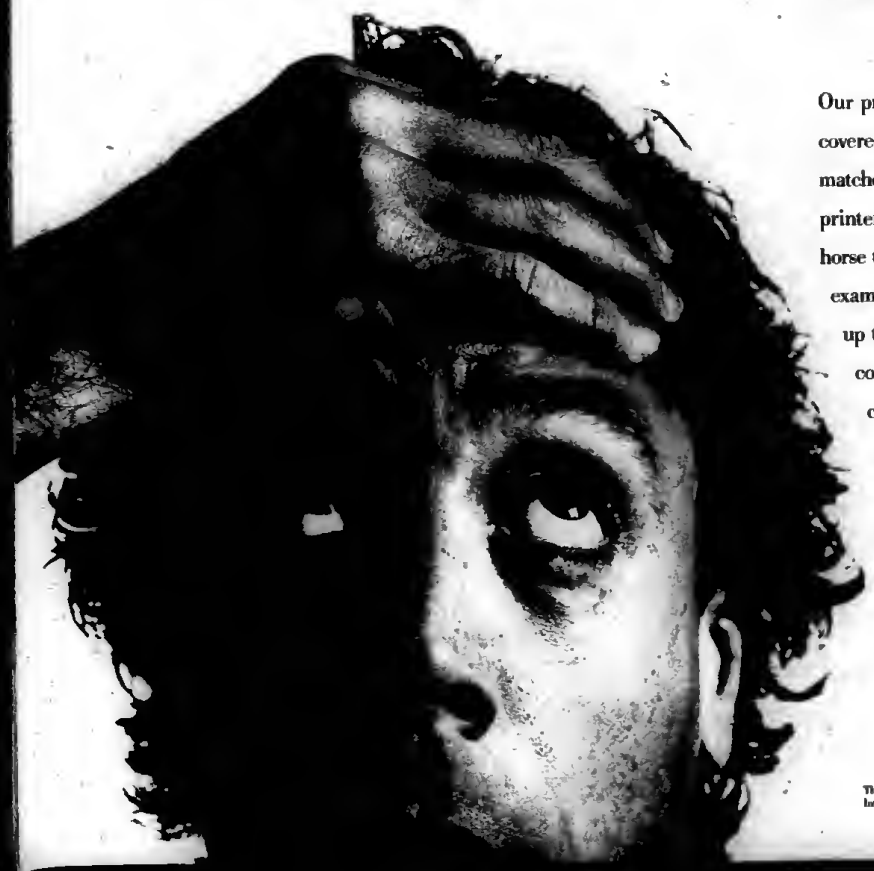
GRRRUNK GRRRUNK

11:32 PM
Realize you never learned those words
in fourth-year French.

11:33 PM
But you have IBM printers. You get IBM service.

11:59 PM
They translate over the phone. Printer's saying,
"Refresh my memory."

12:07 AM
Everything looks smart. Including you.
Thanks IBM.



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While the company sleeps, data center operators choreograph hundreds of processing and print jobs

Graveyard shift

CONTINUED FROM PAGE 126

data center runs 2,200 mainframe jobs daily and prints 1,600 to 2,000 production reports each night.

Reid, Cully and the only woman on the shift, who identifies herself only as Gwen, stack thick printouts onto plastic carts. These reports will be delivered to 100 drop-off points around the building and across the street to be ready when day workers arrive.

Last year, the data center staff printed and moved 64 million pages — a stack roughly 4 miles high. That kind of volume leaves little time for playing Whist or Doom.

Yet like many mainframe shops, the New England has slashed data center staffing in recent years. Fifteen people used to work each shift. Now it's half that.

A planned merger with Metropolitan Life Insurance Co., announced in August, adds anxiety to anonymity. Overall, top management says 200 jobs will be cut or not filled. While no one can say for sure, Bendzans says, things look fairly good for the data center.

Still, yesterday stands next to an uncertain tomorrow in the data center. A few feet from an old IBM 29 card punch, idle IBM 3380 tape drives and other old equipment, an unmanned room houses hundreds of X.400 LANs and a bank of new IBM 9395 RAMAC drives. A new CMOS processor is due later this fall. Thanks to the smaller, more automated new gear, data center size is being reduced from 21,000 sq. ft to 12,100 sq ft.

"It's getting cold in here," Rodriguez says to no one in particular After midnight, the temperature, fixed between 68 and 72 degrees, feels cooler.

At 5:30 a.m , Paulousky and I walk to the darkened break room Neon red and green images flicker across a fuzzy color TV. A half-empty box of donuts sits agape on the Formica table Next to it, a shadowy figure slumps in rest.

"Between 4:30 a m. and 6 a.m., after most printing and batch processing is done, a lot of people take little catnaps," Paulousky says Night work, he observes, requires a more laid-back management style. "I'd rather have them take a 20-minute break and be more productive and safe," he says.

The New England pays night workers a 13% differential over their daytime counterparts.

Outside, black rain sweeps down Boylston. I close my eyes for 15 minutes.

Around 6:30 a.m., the morning crew starts to drift in. "Don't bother me," one day-shift worker half-jokes. "I'm not awake yet." Several head upstairs for coffee.

Others begin to review shift notes and production reports from the previous evening. The night's tally: 32 processing errors. The command center crew spent most of the night fixing a broken tape robot (see page 126).

Bendzans pops in to chat with the night crew around 7 a m. Just after 8 a.m., night workers slip past the hundreds of arriving day workers and out onto the sunny streets, unnoticed. ■

Magliitta is *Computerworld*'s senior editor, corporate strategies

Drama after dark

CONTINUED FROM PAGE 126

1:15 a.m.

StorageTek technician Ted Pothier arrives after being awakened at his nearby home in Arlington. New error messages appear on the console:

START PENDING

UNABLE TO ALLOCATE UNITS

"There goes [unit] 30," Rodriguez says. New error messages arrive. Beep. Beep. Beep.

1:45 a.m.

Paulousky fiddles with a rubber band around his finger.

"Why don't we get rid of that drive — take him off-line," he suggests.

Number 575 goes down. There are no more tape hangers available. Eleven jobs are stuck in the queue.

Pothier agrees. "The channel's backed up. I'd like to get this machine out of your way. We can power down the four drives. You won't have to wait 'til I'm done," he says.

2:10 a.m.

After 15 minutes of console work by Gately and Rodriguez, the stuck drive unleads.

2:45 a.m.

Mixed success. The problem drive has cleared, but three others were knocked off their paths when the controller was reset.

Pothier, suspecting a physical problem, opts to replace the cabling on all the drives. He leaves for a company supply depot 12 miles away.

3:05 a.m.

Paulousky chases his favorite radio station, Oldies 103. "We're having trouble with our computers," he tells the disc jockey. "Can you play 'Help!' by The Beatles for us?"

3:45 a.m.

Using keyboards, Gately and Rodriguez manually direct jobs to the tape machines to keep things moving. "It's not the most efficient way," Gately says. "True," Paulousky says in acknowledgment, "but sometimes the turtle wins the race."



Connecting new cables to the 4401 drive. Not all is good news.

4:05 a.m.

Pothier returns. He pulls the panel from the 4401 and starts installing the new, flat golden cables.

4:35 a.m.

Recabling is complete, but it's still no go. The three drives are still off-line. Paulousky tries to be philosophical. "You really only learn something when something goes wrong," he says. Pothier decides to swap out logic boards.

6:40 a.m.

Striding into the control room, Pothier announces, "All set."

The problem? A thumb-wheel on the drive got stuck between addresses. "The machine was trying to send to a device that didn't exist," Pothier explains.

"Yup," says Paulousky, pointing to the screen. "They're all executing." He leans back in the swivel chair, takes off his glasses and rocks.

Unfortunately, the eight-hour drama has thrown monthly processing behind schedule.

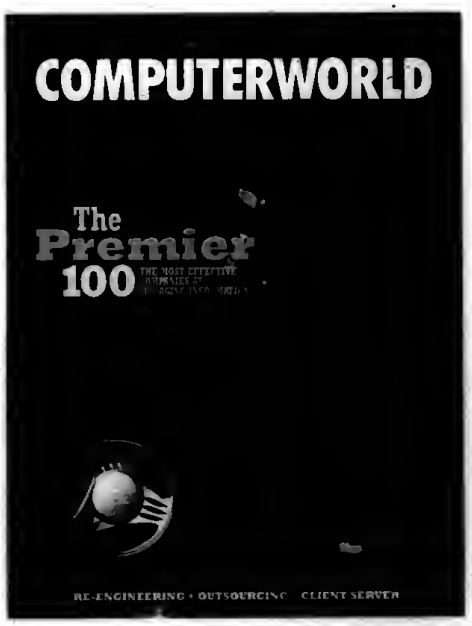
"But we'll catch up tomorrow — er, tonight," Paulousky says.

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Computer Careers

Gender Gap gapes in IS

By Melanie Menagh

The differences between men and women is the latest cause celebre among self-help writers and talk show hosts, but you don't need a research grant from Politically Correct U. to turn up differences between the sexes in IS.

A *Computerworld* survey of more than 500 information systems professionals earlier this year concluded that although men and women in this field have many things in common, they have some different opinions when it comes to IS career satisfaction.

After the survey results were tallied, we made some random calls to men and women in the field and asked for their comments to help us understand why men and women had significantly different ideas. What follows includes our findings from these random calls.

Ratio of women to men in IS

Survey respondents included 472 men and 93 women. While 25% of our 35-and-under respondents were women, that percentage dropped as age increased.

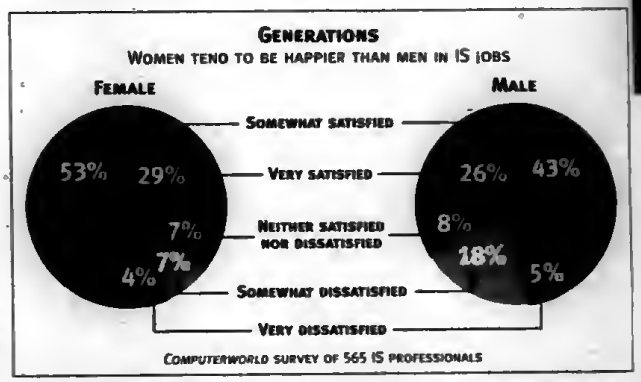
How satisfied are you with your job?

This basic question yielded provocative results. Eighty-two percent of women expressed satisfaction with their jobs; 69% of men said they were satisfied.

Sandra Humphrey, IS director at the American Association of Critical Care Nurses in Aliso Viejo, Calif., said, *"Compared to my background in software development, this is a nurturing environment. There are a hell of a lot of challenges and a ton of work, but I find it rewarding personally that the end result isn't the almighty buck. Our mission is to assist nurses at the bedside, not just make money for the stockholders."*

Gary Holden, senior analyst at Massachusetts General Hospital in Boston, said, *"Compared to most people I talk to, I think my job is fun. I like working with the research community; my ability to work with computers has opened a lot of different doors."*

But Eric Fixler, interaction designer at Silicon Graphics, Inc., expressed reservations. *"I'm not especially satisfied. Smaller teams, less interference by managers and a more focused vision would be better,"* he said.



Are you working to your full potential?

More women said they are working to their full potential (52% of women vs. 44% of men). Some of the men complained of being asked to do tasks that don't relate to their interests or expertise. *"After 24 years at a big corporation, I'm now working at a small company,"* said Bob Fitton, technical specialist at Capella Northwest in Bellevue, Wash. *"I have to do a lot of different things — some that are beneath my capacities."*

Said Holden, *"I end up doing a lot of fixing people's printers, moving computers from room to room. It's not the best use of my time."*

What factors keep you from working to your full potential?

Both sexes cited factors such as too much work (15.4% of women, 10% of men) and lack of training (12.8% of women, 10% of men). One factor that bothers women significantly more than it bothers men is lack of direction. Twenty-three percent of women voiced this complaint; 8% of men did.

"It's difficult, with times the way they are, for women to get that mentoring," said Andree Greer, regional communications manager at Federated Systems Group in Norcross, Ga. *"I've noticed that a man often puts on a political face of listening and caring, but behind that he's not really interested in helping with my problem."*

Fixler has had positive experiences. *"Most places I've worked at for any amount of time, there's been someone I can go to when I really need advice, someone you deeply respect who has pride in their work,"* he said.

Do clearly defined roles and responsibilities increase your job satisfaction?

Of the women, 48.4% said yes, as did 35.9% of the men, some of whom seem to prefer a more freewheeling approach. *"You can exploit a lack of direction,"* Holden said. *"If you can figure out where people want to go before they do, you can choose how to get there, and you can choose a path that you find personally more satisfying. I prefer to have less clearly defined authority."*

Virginia Adkins, network manager at Union City Insurance, Inc. in Union City, Tenn., said she is comfortable and secure with a well-defined role. *"I have complete authority over the bottom line. I'm on the board of directors; I have input because the other board members don't always understand the technology,"* she said.

What are the most important skills for an IS manager?

In determining the most important managerial qualities, men and women showed remarkable agreement on skills such as flexibility, business sense and technical knowledge. The big difference came when respondents were asked about a manager's willingness to defer to knowledge of subordinates. About 53% of women but less than 40% of men said this was a significant factor. *"It's important for a manager to listen and occasionally defer to his people,"* Fitton said, *"but ultimately it is the manager's job to make the final decision and overrule them if necessary."*

Humphrey said she maintains an atmosphere of give and take in her department. *"We seek to keep each other informed,"* she said. *"I don't believe in hoarding authority; to me, that style doesn't cut it these days."* ■

Menagh is a freelance writer in New York.

Generations

The impetuosity of youth, the wisdom of age. Beyond cliches, how does the IS workplace look from the vantage point of a seasoned campaigner vs. that of the new kid on the platform? The *Computerworld* survey wanted to find an effective motivator for IS employees.

Job security was ranked as the single most effective motivator (in the 20% to 23% range) by all age groups. However, money was vital to younger respondents: 17% of the under-35 respondents said it was most important, while 9% of the over-45 respondents said it was.

30%
Of IS professionals in the 45-to-54 age group are most likely to be "very satisfied" with their jobs

26.4%
Of all age groups say the same thing

35%
Of those over age 55 are most likely to be "dissatisfied" or "very dissatisfied"

Michael Stalcup, 23, a systems programmer at Carolina Freight in Cherryville, N.C., said, *"Money is an attraction; it's a wide-open field. After all, you're in the business to get ahead."*

The youngsters find exposure to new technologies more important (33% of those under 35, 20% of those 45 and over). The older generation finds freedom in decision-making and increased responsibilities important (27% of those under 35, 69% of those 45 and over).

"I feel fortunate to constantly explore and learn and be curious," said Sharleen Smith, new technology coordinator at USA Networks in New York. Smith, who is just out of graduate school and in the under-35 category, added, *"It's great that a company like USA that is not specifically committed to research is willing to let me explore."*

Her colleague, Jim Degni, director of IS at USA Networks, has worked in IS for 25 years. He said, *"I have a lot of autonomy. Management that oversees IS is much more interested in 'When am I going to get it?' I just selected a relatively expensive server. My boss didn't say, 'Why don't you look at this and that?' He wants to be involved, but not on a day-by-day basis."*

Challenges abound, no matter what the generation. In the over-45 class, Henry Paulsen, staff vice president of information resources at Dresser Industries in Dallas, said, *"One of my greatest goals has been to get IS professionals to align their energies with the needs of their customers. [Information technology] must be viewed as tools for providing services to the enterprise, not as a shrine unto itself."*

— Melanie Menagh

Renewed manufacturing, software start-ups boost IS demand in Great Lakes region

Lakes front IS growth

By Alan R. Earls

America became coast-conscious in the 1980s. Most of the country's economic growth seemed to center on Eastern enclaves such as New York and Washington. And fast growth in Seattle, the Silicon Valley and other prominent Western sun spots became etched on the public consciousness.

But the 1990s are seeing a resurgence in what used to be known as America's "Rust Belt" — the Great Lakes region, which includes Chicago, Detroit, Cleveland, Buffalo, N.Y., and points as far east as Rochester, N.Y. The rebirth, which spells better times for computer professionals, can be attributed partly to a rebound in manufacturing.

UNEMPLOYMENT RATE, GREAT LAKES CITIES:

Buffalo/Niagara region	5.5%
Chicago	4.7%
Cleveland	5.0%
Detroit	6.3%
Rochester	4.4%

Source: U.S. Bureau of Labor Statistics July 1995 data

A continued shift toward information systems outsourcing makes the picture more complex. And there is a new wave of software entrepreneurs in many Great Lakes cities whose companies are boosting demand for IS talent. Taken together, those trends are pumping up demand, not only for the latest IS skills but also for "legacy-oriented" backgrounds. "The really good news is that the Rust Belt is now the shiniest part of the country," says Shirley Bascom, owner and president of Management Recruiters-North Canton, just outside of Cleveland.

To be sure, things aren't completely rosy for everyone. Some companies continue to pare their labor forces, and outsourcing is still big business. For example, bellwether General Motors Corp. in the Detroit area gives most of its IS work to subsidiary Electronic Data Systems Corp., according to spokesman Chuck LeCarre.

Dan Bortfeld, staffing manager at EDS in Detroit, says active hiring is taking place on behalf of many kinds of firms across the region and in diverse industries. He notes that recent research shows fewer people with IS skills will be coming out of universities during the next few years. It will be necessary for EDS to hire even more experienced people, Bortfeld says. "We need people with skills in Cobol, PL/1 and DB2 as well as Unix, C language and client/server-oriented skills," he says.

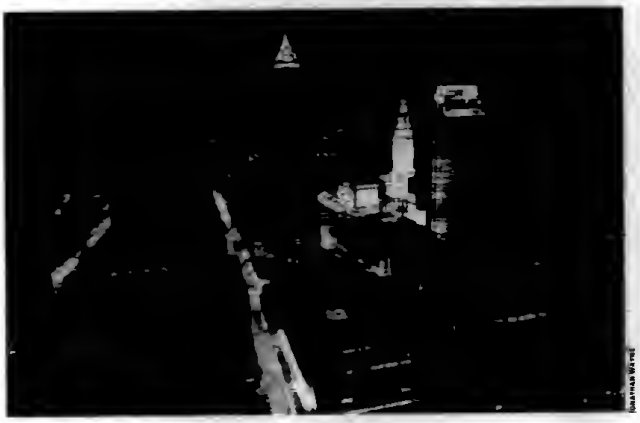
Recruiter Bill Swanner, Detroit branch manager at Source Services Corp., agrees there is a modest resurgence in demand for mainframe skills. He says the Motor City has "no down sectors in terms of IS."

The situation is similar in Buffalo and Rochester — there is more outsourcing, but a generally upbeat business environment in those cities helps to ensure a strong overall demand for IS help.

Eastman Kodak Co. in Rochester is taking a cautious approach to growth. Dick Clute, human resources partner at Kodak, says three years of budget cuts and staff reductions are over. He says the company is strengthening IS support for out-of-country business units and building internal networking capacity. "We are now looking mostly for skill sets that are hard to find in the Rochester area," he says. Those in-demand skill sets include LAN administrators; Oracle Corp. database administrators; application developers in PC, Oracle and Unix environments; and electronic data interchange specialists.

The focus is different at Fisher-Price

Lakes front, *page 135*



Cities such as Cleveland are seeing fresh demand for IS talent

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- Erie County
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Source: Greater Buffalo Partnership. Ranked by area employment.

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Source: Center for Governmental Research, Rochester. Ranked by area employment.

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- TRW
- KeyCorp
- LTV
- Roadway Services

Source: Greater Cleveland Growth Association. Ranked by 1993 revenue

DETROIT AREA
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- General Motors
- Chrysler
- Detroit Medical Center
- Ameritech

Source: Greater Detroit Chamber of Commerce. Ranked by area employment.

Lakes front IS growth

CONTINUED FROM PAGE 134

Toys, Inc., just outside of Buffalo. Spokeswoman Laurie Strong says the firm's entire IS function was outsourced. Xerox Corp.'s Rochester-area units are taking a similar path with the help of EDS.

Paul Wetenhall, a Xerox veteran and president of 2-year-old QSoft Solutions, Inc., a Notes partner company, says the Rochester area has an abundance of experienced people from the larger companies "working to reinvent themselves."

However, Gordon Rogers, president of software training firm Meliora Systems, Inc. and head of a local association of software executives, says his 21-person operation is hard-pressed to find the people needed to sustain rapid growth in new companies.

Particularly hard to find, he says, are individuals with experience in C++ and Microsoft Corp.'s Visual Basic. "We often have to hire someone with potential and then train them," he says. But there is still a good base of talent for growing software companies here, he says.

There is a groundswell of new company activity in Chicago, and it is helping to heat up the employment scene. Dave Reed, director of recruiting for the Americas at Andersen Consulting, says finding entry-level people has been problematic in recent years. There is demand for experienced and entry-level people with skill sets such as Smalltalk, SQL, Unix, C++, graphical user interface design, relational databases and multimedia, he says.

Increasingly, Reed says, his company must compete for talent with not just Fortune 500-size firms but also with the region's smaller technology start-ups. "We try to make the case that we have a track record of 20% annual growth over the last five years, while some start-ups may not last that long," he says.

Ron May, president of Specific Recruiting, Inc. in Chicago, has noted increased software start-up activity and strengths in the medical sector. "I've seen an overall increase in skills associated with a more mature client/server market" in all industries, he says. That includes help desk staff and maintenance. Support people are often expected to have a broad background, including telecommunications skills, he says.

Ed Denison, executive director of the recently formed Chicago Software Association, says his 300 member companies are clamoring for help. "Client/server has really taken root, and the whole field is wide open here," he says.

Cleveland has seen improved business conditions, notwithstanding a few bleak spots such as NASA's Lewis Research Center. The center is being threatened with federal budget cuts.

"The market is the best it has been in the last four years," says Tom Mayer, associate director of Source Services Corp., a recruitment firm. But he acknowledges most companies are still careful about head count.

Most in-demand skills are the specialties that are hot everywhere — technologies such as Sybase, Inc.'s SQL Server and Powersoft Corp.'s PowerBuilder, C++ and Visual Basic. Raymond Neff, vice president of IS at Case Western Reserve University, says the region's job market is a boon to graduating students who "have no trouble getting jobs." He says the university is retooling its staff with newer technologies such as Novell, Inc.'s NetWare and C++.

A similar note is sounded by Dave Nemeth, manager of IS at Ohio Edison Co. in Akron, where migration away from the mainframe continues. "There are a lot of jobs in the Cleveland and Akron area, and most of them are in the client/server environment. We find that as soon as we train people, we tend to lose them," he says. For newer skills, including Notes, "it is a seller's market," he says.

Melissa Armstrong, a researcher at the Detroit Economic Development Department, says too often the realities of the Rust Belt, especially its burgeoning technology sector, have been overshadowed by its past image.

In particular, she cites changes in the dominant auto manufacturing sector, which is increasingly dependent on new technologies.

"There has been a rise in the importance of computers and engineering, so the region's companies are using more high-level people," she says. ■

Earls is a freelance writer in Franklin, Mass.

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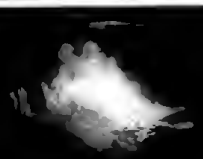
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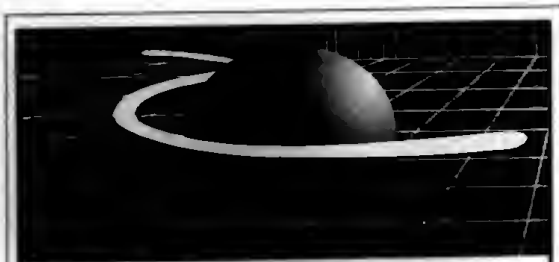
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An experienced IS professional is needed to manage the development of administrative and engineering application systems through defining business requirements, evaluating system/project alternatives, implementing new systems, and supporting current applications. Responsibilities include participating in automation of various business areas, identifying technology solutions and negotiating with suppliers.

The candidate should have a degree in Computer Science or equivalent and 12 years IS experience including project management, staff development, and development of commercial/administrative (Financial, human resources, administrative and engineering) information systems. A knowledge of business processes is required, plus an understanding of client/server technology (experience preferred). (Ref No. ICS/2)

SENIOR SYSTEMS ANALYST (END-USER COMPUTING)

Applicants must have at least 8 years' experience in micro-based information technology with emphasis on analyzing business requirements to develop and implement strategies for effective end-user computing. Very good communications and presentation skills are essential as is the ability to work in a multinational environment. The applicants must have a degree in Computer Science or equivalent, and an excellent awareness of current directions in microcomputer and LAN technologies, plus in-depth knowledge of current products such as Novell Netware, cc:Mail, Windows, Excel and Harvard Graphics

Responsibilities include evaluation of PC software and hardware, development of policies and procedures for PC end-users, and promotion of new technology by presentations and seminars in user departments. (Ref No. ICS/3)

SYSTEMS ANALYST (COMMERCIAL SYSTEMS)

Applicants must have at least 6 years solid experience in information systems development, preferably in the Oil & Gas industry, and a degree in Computer Science or equivalent. Experience is required in the following areas: Client/Server design and development, Oracle RDBMS tools and GUI, MS Access, Visual Basic, C++ and SQL, plus familiarity with IBM VM and VSE operating systems and associated tools (e.g. CMS, CICS, COBOL, VSAM), CASE and Project Management tools. Responsibilities include data analysis and requirements specification for new application systems. (Ref No. ICS/4)

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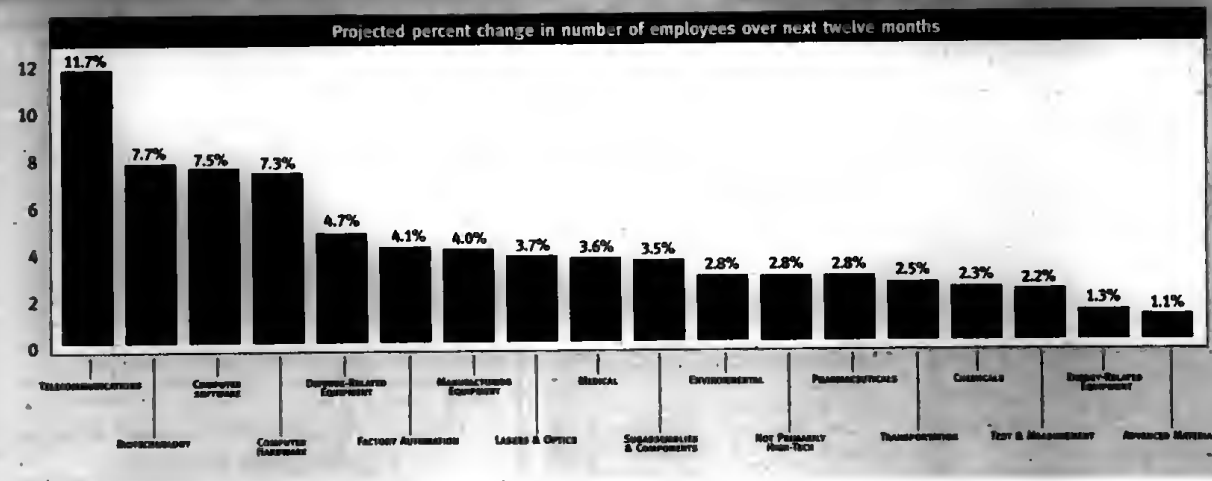
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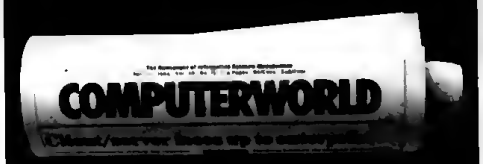
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• Applicant Tracking	
9:15 a.m. - 12:10 p.m.	How To Pick The Right People
12:15 p.m. - 2:00 p.m.	The Top 10 Trends Affecting Information Systems Careers
2:10 p.m. - 3:05 p.m.	Repeat of Concurrent Sessions
3:20 p.m. - 5:00 p.m.	Town Hall Forum
5:00 p.m.	Program ends



How To Pick The Right People
9:15 a.m. - 12:10 p.m.
Dr. William Swan
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The Top 10 Trends Affecting Information Systems Careers
12:15-2:00 p.m.
Luncheon/Keynote Address
Paul Gillin, Executive Editor, Computerworld
Sure, there are new skills entering the market every day, but what are the top 10 trends you should really keep an eye on? Paul Gillin, one of the country's leading watchers of the Information Systems profession will give you an up-to-the-minute view in this very special keynote address.

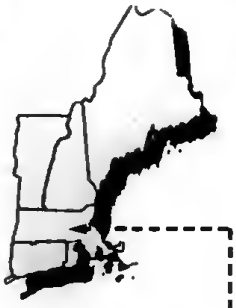


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Marketplace

Who pays RETAIL?

Mainframe buyers actually may have more leverage since IBM threw out its price list

By Leslie Goff

Negotiating fair mainframe pricing with IBM, without a published price list, is a bit like alchemy: It's part art and part science. Ynu may not end up with gold, hut with some planning you'll at least have spare change to funnel back to information systems coffers.

IBM stopped publishing its mainframe list prices when it switched to less expensive, water-cooled CMOS architecture machines, notes Carl Greiner. He is vice president and service director of Enterprise Data Center Strategies at Meta Group, Inc. in Stamford, Conn.

"We have a dichotomy with a high pricing structure and high-support costs for a very fast mainframe and a lower-priced technology that's no where near as fast," Greiner explains. "Not everyone can maintain both at the same time, so IBM won't publish its price list."

The cost per MIPS is steadily coming down. Users will pay 28% less for mainframes next year compared with this year's levels, Greiner says. And from next year on, prices should fall an average of 35% annually, he adds.

Of course, the average price per MIPS is "the million-dollar question," says Mark McManus, editor in chief at Computer Economics, Inc. in Carlsbad, Calif. McManus said his firm gets a composite of fair-market rates based on interviews with IBM customers and other sources.

He estimates that as of last month, IBM's average price per MIPS ranged from $15,000 at the low end to $17,000 at the high end for CMOS machines

Greiner says that emitter-coupled logic mainframes average $20,000 per MIPS. Even that is a fraction of the $65,000 or more that analysts say users paid for mainframes in 1991.

McManns says the actual price depends on the customer. "They may or may not be getting a great deal. It depends on how much they are purchasing, if they are a major account and other factors," he explains "And since most manufacturers have gone to a system of hundling products, that makes it very difficult to decipher how much one piece of equipment costs."

Nevertheless, IBM customers are confident about the pricing strategy. Thomas Loane, vice president of information services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., says IBM's lack of published list prices puts him in the driver's seat at the negotiating table.

"We tell IBM what we're willing to pay. Can you imagine?" he says. "That's a very effective negotiating position."

The trick, Loane adds, is to walk into the war room armed to the hilt. "You never get the best price until you have competition. So hy definition, my joh is to create competition," he explains.

To do this, he collects price quotes from alternate vendors, lessors and used mainframe dealers. "You can always put together a competitive compendium of used machines," Loane says. "And you should never let your ego rule out buying used mainframes."

Mainframe buyers measure the competitiveness of hids against the fair-market price per MIPS as estimated in several independently pnblished price lists.

John Foley, a superintendent in the systems planning department of a large insurance firm, says he and his staff talk to other IBM customers about the deals they have struck.

"We never ask for a bottom-line price, hut we get a feel for how much IBM is willing to negotiate. That helps us set our expectations," Foley says. "Based on all our information, we have a formula that we use to extrapolate what IBM's list pricing should be. It's more art than science — no one can scientifically reduce it down to pure nnmbers — but we get a gut feeling," he says.

Greiner says IBM will probably resume puhlishing list prices as soon as more users are further along the CMOS technology curve. In the meantime, users are nonplussed

"Who cares?" Loane says. "No one ever paid list anyway. If you were paying list before, you were paying too mnch." ■

Goff is a freelance writer in New York.

Buyers' checklist

1. Create competition: Gather quotes from lessors, used computer dealers, plug-compatible manufacturers and vendors of alternate technology solutions.
2. Calculate a fair-market price per MIPS: Consult independently published price lists for new and used mainframes, talk to other IBM customers.
3. Determine long-term software strategy and costs.
4. Factor in environmentals and other costs of operation.
5. Tell IBM what you're willing to pay.

Intelligence Report

While consulting firms such as Meta Group and Gartner Group, both in Stamford, Conn., provide clients with pricing guidelines and contract negotiation strategies, several companies publish newsletters and source books that attempt to take some of the pricing guesswork off IS executives' hands.

Computer Economics, Inc.
Carlsbad, Calif.
Mark McManus, editor in chief
(800) 326-8100
Email: cer@compecon.com

Computer Economics Report: Monthly newsletter that estimates list prices and residual values for IBM and plug-compatible mainframes.

Computer Economic Sourcebook: Quarterly publication that lists prices and forecasting residuals for IBM, Digital, HP and Sun hardware.

Daily Marketing Corp.
Costa Mesa, Calif.
Tim Daley, president
(800) 727-1362
Email: daleydmc@ix.netcom.com

IBM Price List: Monthly newsletter features estimated prices for IBM mainframes.

PCM Price List: Quarterly publication features list prices for Amdahl, Hitachi and other IBM-compatible manufacturers.

Market Value Reports: Monthly "blue books" feature suggested prices for IBM and plug-compatible midrange and mainframe markets.

Computer Price Watch
Arlington, Texas
Dale Taylor, editor
(817) 654-0346

Computer Price Watch: Monthly newsletter features lease rates.

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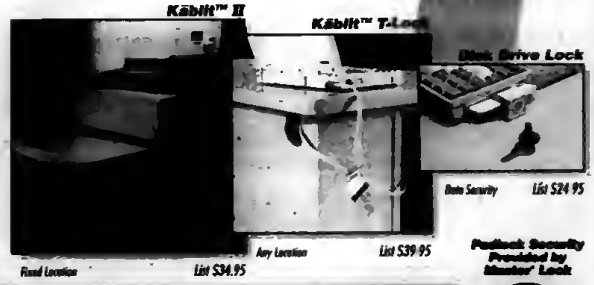
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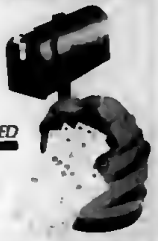


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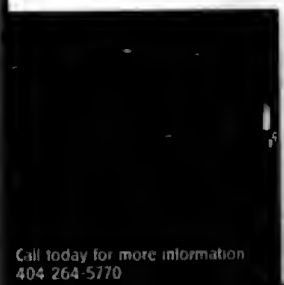
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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

UNITED STATES OF AMERICA,
Plaintiff,

-vs-

INTERNATIONAL BUSINESS MACHINES CORPORATION,
Defendant.

Civil Action No. 72-344 (AGS)

TAKE NOTICE that International Business Machines Corporation ("IBM"), defendant in this antitrust action, has filed a motion for an order terminating the final judgment entered by the United States District Court for the Southern District of New York on January 25, 1956 (the "Final Judgment"). The United States of America, plaintiff, has tentatively consented to IBM's motion in certain respects, but has reserved the right to withdraw its consent for at least 90 days after publication of this Notice. The Complaint, Final Judgment and proposed termination are further described below.

This Notice relates solely to those aspects of the Final Judgment to which the United States has tentatively consented to termination. A further notice will be published before any action on IBM's termination motion as it applies to the remainder of the Final Judgment. Prior to entry of an order terminating any aspect of the Final Judgment, the Court and the parties will consider public comments. Any such comments on the proposed terminations described in this Notice must be filed within 90 days.

The Final Judgment was entered by consent between IBM and the United States, settling an action filed on January 21, 1952. The Complaint in that action alleged that IBM had monopolized, attempted to monopolize and restrained trade in the tabulating industry, in violation of Sections 1 and 2 of the Sherman Act. Among other things, the Complaint alleged that IBM had restrained the development and growth of: other manufacturers of tabulating machines, attachments for tabulating machines and tabulating cards; businesses involved in the purchase and sale of used tabulating machinery; independent service bureaus; maintenance and repair businesses and parts businesses. The Complaint alleged that IBM only leased, and refused to sell, tabulating machines. Through its lease agreements, IBM allegedly: charged lessees a single price for machine rental, instruction and repair and maintenance; limited machine uses; restricted attachments to, alterations in, or experimentation with such machines; and required grant backs of any inventions resulting from a breach of the prohibition on experimentation. The Complaint alleged that IBM operated its service bureaus to preempt demand for the products of other manufacturers and restrained the growth of independent service bureaus by discriminating in favor of its own service bureau.

The Final Judgment applies to IBM's conduct with respect to tabulating machines and cards, both of which IBM has not manufactured for many years, and "electronic data processing machines." Certain provisions of the Final Judgment have expired or no longer apply to IBM's business. However, other provisions of the Final Judgment continue to apply to IBM's electronic data processing machine business.

The United States has tentatively agreed to terminate certain sections of the Final Judgment in their entirety: (a) Sections V(b) and (c), which require IBM to offer to sell or no more than specified prices and for a specified period used IBM machines that IBM acquires pursuant to trade-ins or as a credit against sums then or thereafter payable to IBM, and (b) Section VIII, which specifies conditions under which IBM may engage in "service bureau business" as defined by Section II(k) of the Final Judgment. Section VIII requires IBM to conduct its service bureau business through a subsidiary that is required to charge prices for services it renders based upon rates that fairly reflect all expenses properly chargeable to the subsidiary, except that the service bureau subsidiary may reduce any price to meet a competitor's price. Section VIII also prohibits IBM from providing machines to its service bureau subsidiary except on the same terms and conditions that are available to other service bureaus.

The United States also has tentatively agreed to terminate all other provisions of the Final Judgment except as they apply to the System/360, 370 and AS/400 families of products and services (insofar as such services are affected by Sections VI, VII, IX and XV of the Final Judgment). These other provisions of the Final Judgment, among other things: (a) to fulfill the purpose of the Final Judgment in assuring to users and prospective users of IBM machines an opportunity to purchase those machines on terms and conditions that are not substantially more advantageous to IBM than the terms and conditions for leases of the same machines, require IBM to sell its machines at prices that have a commercially reasonable relationship to the lease charges for the same machines; (b) restrict IBM's ability to reacquire previously sold IBM machines; (c) require IBM to offer to machine owners or reasonable and nondiscriminatory prices repair and maintenance service for as long as IBM provides such service, provided that the machine has not been altered or connected to another machine in such a manner that its maintenance and repair is impractical for IBM; (d) require IBM to offer to machine owners and to persons engaged in the business of providing repair and maintenance services, at reasonable and nondiscriminatory prices, repair and replacement parts for as long as IBM has such parts available for use in its leased machines; (e) restrain IBM from requiring that lessees or purchasers of IBM machines disclose to IBM the uses of such machines, from requiring that purchasers of IBM machines have those machines maintained by IBM and generally from prohibiting experimentation with alterations in or attachments to IBM machines; (f) require IBM to furnish to owners of IBM machines certain manuals, books of instructions and other documents relating to IBM machines that IBM furnishes to its own repair and maintenance employees; and (g) require IBM to furnish to purchasers and lessees of IBM machines certain manuals, books of instruction and other documents that pertain to the operation and application of such machines.

IBM and the United States have each filed with the Court memoranda setting forth their respective positions. Copies of the Complaint, the Final Judgment, the Stipulation containing the Government's tentative consent, the memoranda and all other papers filed in connection with this motion are available for inspection at the Office of the Clerk of the United States District Court, Southern District of New York, United States Courthouse, 500 Pearl Street, New York, New York 10007 and at Suite 215, Antitrust Division, Department of Justice, 325 7th Street, N.W., Washington, DC 20530 (Telephone 202-514-2481). Copies of these materials may be obtained from the Antitrust Division upon request and payment of the copying fee set by the Department of Justice.

Interested persons may submit comments regarding this matter within the sixty (60) day period established by Court order. Such comments must be filed with the Office of the Clerk of the United States District Court, Southern District of New York, 500 Pearl Street, New York, New York 10007 with copies mailed at the time of filing to: (a) counsel for IBM, Peter T. Barbur, Esq., Cravath, Swaine & Moore, Worldwide Plaza, 825 Eighth Avenue, New York, N.Y. 10019; and (b) counsel for the United States, Kent Brown, Attorney, Computers & Finance Section, Antitrust Division, United States Department of Justice, Judiciary Center Building, Suite 9001, 555 4th Street, N.W., Washington, D.C. 20001 (Telephone 202-307-6200).

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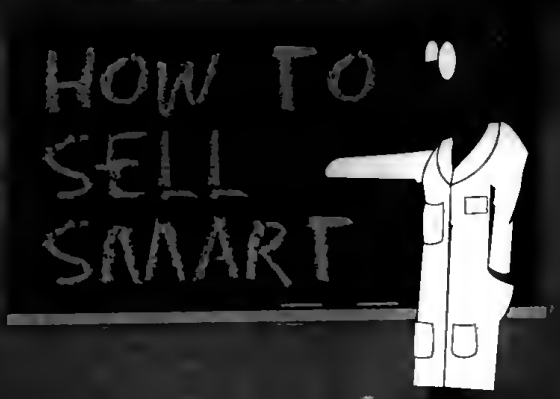
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What goes up must come down

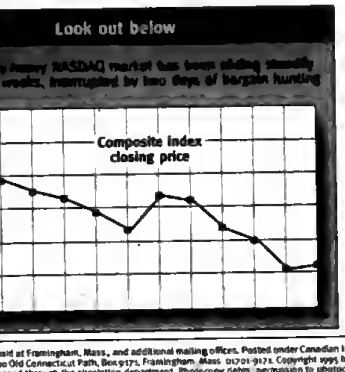
As if adhering to Newton's law, technology stocks rose dramatically during the spring and summer and have sharply declined this autumn. Market analysts have been predicting since the middle of the summer that although physics has little do with it, a market correction was due.

The technology-heavy NASDAQ exchange has been tumbling in recent days (see chart), and it will continue to drop, said Scott Butler, an analyst at "Red Chip Review," a newsletter in Portland, Ore. "Historic valuations were way out of whack, and a correction was long overdue," he said.

Mike Murphy, editor of "The California Technology Stock Letter," a newsletter in Half Moon Bay, Calif., said the event that drove the market's reversal was "the really slow start to sales of [Microsoft Corp.'s (MSFT)] Windows 95." He said many technology companies built up inventories, anticipating large Windows 95 orders.

But Windows 95 hasn't sold in the huge quantities Wall Street expected. "Wall Street was anticipating about 2 million [packages] a week shipping, and the numbers have been more like 2 million a month," Murphy said. The result is, "lots of people are stuck with overloads." Disk drive makers and dynamic and static RAM manufacturers could be affected, Butler said.

Even companies far removed from Windows 95 have been caught in the rush to sell technology stocks because "Wall Street isn't too good at differentiating between different areas in technology stocks," Murphy explained. Even companies involved in communications and client/server enterprise products, such as 3Com Corp. (COMS), Oracle Corp. (ORCL) and Sun Microsystems, Inc. (SUNW), will feel these market effects for a while, Murphy said. He said he foresees technology stocks overall "still dropping as much as 15% from current levels." — *Stewart Deck*



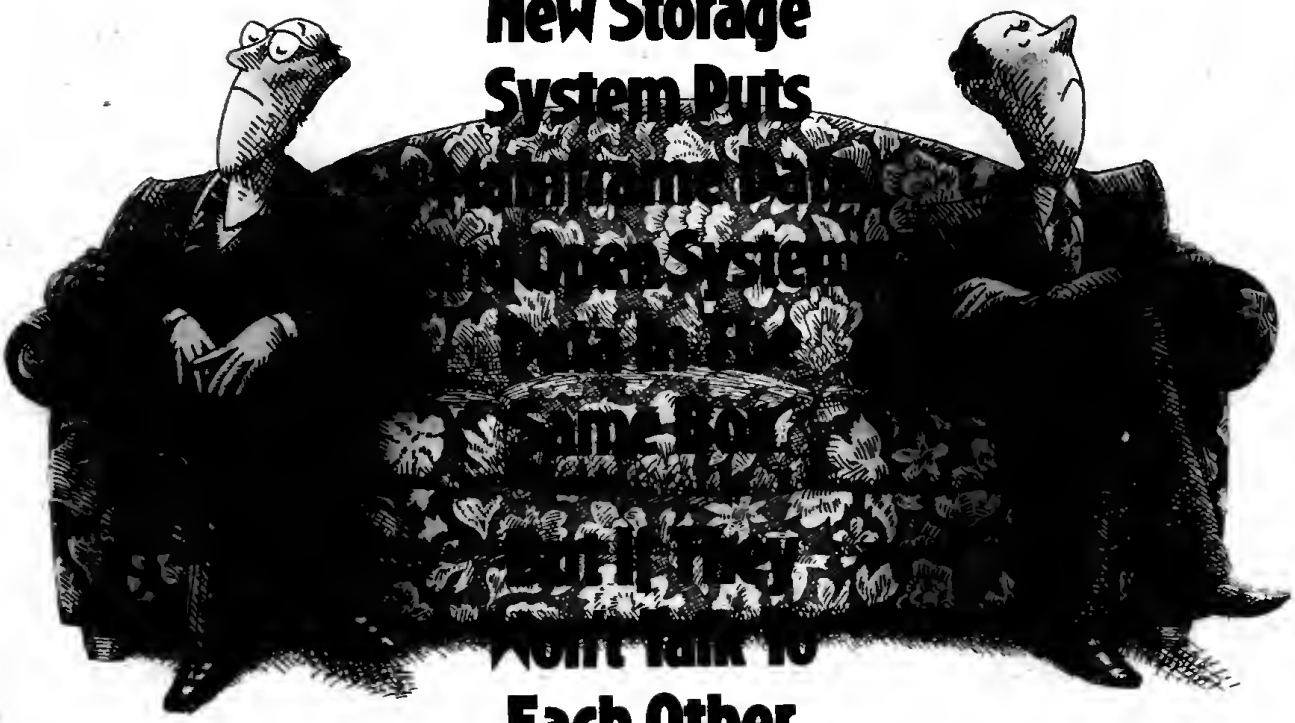
Exch	52-Week Range			Oct 6 '95	Wk Net Change	Wk Pct Change
COMS	46.00	17.00	3 COM Corp	45.50	-0.75	-1.6
AIT	52.25	38.00	AMERITECH Corp	50.75	-0.75	-1.5
T	66.38	47.25	AT&T (N)	63.88	-1.63	-2.5
ASND	88.25	10.88	Ascend Communications	80.00	1.75	2.2
BNYN	19.75	9.38	Banyan Systems Inc. (L)	9.50	-0.50	-5.0
BNET	57.13	25.13	Bay Networks Inc.	55.38	1.38	2.5
BEL	62.25	46.38	Bell Atlantic Corp (N)	60.13	-1.25	-2.0
BLS	76.25	50.50	BellSouth Corp	75.63	0.25	0.3
BBN	38.38	12.63	Bolt, Beranek & Newman	36.13	-0.75	-2.0
BKET	22.25	9.00	Broadcast Technology	18.75	-1.50	-7.4
CS	59.25	37.38	Cabletron Systems	64.25	2.00	3.0
CBRN	22.25	12.25	Cerebrus Communications	20.50	3.13	17.6
CHPN	31.13	20.00	Chipcom Corp	27.50	-1.38	-2.8
CSCO	75.88	25.50	Cisco Systems Inc.	58.75	0.25	0.4
CEIX	11.38	6.13	Compression Labs Inc.	7.63	-0.13	-1.6
CMNT	12.75	6.75	Computer Network Tech.	8.88	0.13	1.9
XCOM	14.50	7.50	CrossCom	13.13	0.44	3.4
DASW	4.50	2.13	Data Switch Corp	4.50	0.00	0.0
DIGI	64.00	26.88	DSC Communications	52.38	-7.63	-12.7
FORE	42.00	19.63	FORE Systems Inc.	33.75	2.75	-7.3
GDC	35.88	9.25	General Datacomm Inds.	14.38	-0.38	-2.5
GTE	46.00	29.50	GTE Corp. (N)	39.50	0.25	0.6
ITT	129.50	77.00	ITT Corp.	120.63	-4.13	-3.3
MCIC	27.13	17.25	MCI Communications Corp	26.13	0.00	0.0
MICM	13.88	5.50	MICOM Communications Corp.	10.13	-0.63	-5.8
MNPI	22.25	6.63	Micrcom Inc	16.88	1.00	6.3
NTRX	10.50	4.38	Netrix Corp	4.75	-0.13	-2.6
NCDI	12.00	3.25	Network Computing Devices	6.00	-0.88	12.7
NWK	42.00	12.00	Network Equipment Tech. (N)	30.88	-1.50	3.4
NETG	46.75	38.63	Network General	41.75	0.75	1.8
NN	43.38	27.00	Newbridge Networks Corp	27.38	-1.00	-3.4
NT	41.00	31.25	Northern Telecom Ltd	35.25	-0.38	-1.1
NOVL	25.25	14.13	Novell Inc.	17.75	-0.75	-4.1
NYN	48.75	35.00	Nynex Corp.	46.88	-0.63	-1.3
OCTL	42.63	17.25	Octel Communications Corp	33.00	2.63	-7.4
ODSI	43.25	8.50	Optical Data Systems Inc.	39.25	-4.25	-10.8
PMRL	9.38	2.13	Pemrl Data Comm Networks	6.63	-1.06	13.8
PCTL	62.00	15.50	Picturetel Corp	45.38	-0.75	-1.6
PTON	10.75	4.75	Proxicom Inc.	8.13	-0.69	-7.3
RACO	7.88	3.00	Racotek Inc	6.13	-0.25	-3.9
RETX	6.13	3.50	Retix	4.00	-0.75	-15.8
SFA	24.88	15.00	Scientific Atlanta Inc. (L)	15.00	1.88	-11.1
SBC	55.13	38.25	Southwestern Bell Corp (N)	34.38	-0.13	-0.3
FON	58.88	25.88	Sprint Corp.	36.00	1.25	-3.3
SMSC	31.63	32.50	Standard Microsystems Corp.	16.00	1.25	-7.2
STRM	57.50	17.38	Stratacom Inc.	31.25	-3.31	-9.6
TBIT	8.13	3.63	Telebit Corp.	3.88	-0.50	-11.4
USRX	91.50	15.38	US Robotics	61.50	3.50	6.3
USW	48.38	29.63	US West Inc.	47.13	-0.13	-0.3
XIRC	23.50	9.13	Xircom	13.38	0.38	2.7
XLGX	58.75	13.13	Xylogics Inc.	56.50	1.25	2.3
AALR	9.63	3.63	Advanced Logic Research	8.13	0.38	4.8
AAPL	50.13	33.00	Apple Computer Inc.	30.88	-1.00	-2.2
ASTA	19.13	9.50	AST Research Inc (L)	9.63	-0.75	-7.2
CPQ	54.75	30.25	Compaq Computer Corp	48.13	-0.63	-1.3
DELL	93.00	35.38	Dell Computer Corp.	82.75	3.69	-4.3
GATE	33.75	16.00	Gateway 2000 Inc.	29.50	-0.50	1.7
HWP	85.88	41.25	Hewlett Packard Co.	82.63	-1.25	-1.5
MUEI	29.88	3.25	Micron International Inc.	21.00	-2.25	-9.7
SGI	65.63	24.13	Silicon Graphics	32.13	-2.61	-6.6
SUNW	66.25	37.13	Sun Microsystems Inc. (N)	58.00	-6.38	-9.9
TAN	64.38	41.00	Tandy Corp	58.88	0.13	3.3
AMH	13.63	8.00	Amdahl Corp	9.75	0.13	1.3
CPTR	8.88	3.63	Compuer Computer	6.50	0.00	0.0
CYR	74.38	14.63	Cray Research Inc	21.75	-0.38	1.7
DGN	12.00	6.75	Data General Corp.	9.88	-0.88	-8.4
DEC	46.50	24.88	Digital Equipment Corp	44.50	-1.50	-3.2
ENCC	5.38	1.06	Encore Computer Corp	2.00	-0.13	-5.9
HNWR	18.50	9.25	Harris Computer Systems Corp.	16.25	-0.25	-1.5
IBM	114.63	67.38	IBM	94.50	0.00	0.0
MDCO	19.25	3.00	Meridian Data Inc. (N)	10.38	0.50	5.1
NETF	11.25	6.25	Netframe	7.88	0.25	3.7
SQNT	25.38	14.13	Sequent Computer Sys.	19.00	-0.94	4.7
SEQS	50.00	3.33	Sequoia Systems Inc.	6.88	-0.63	-8.3
SRA	35.88	23.00	Stratus Computer Inc.	26.13	-0.38	1.4
TDM	19.25	11.75	Tandon Computers Inc.	12.00	-0.25	-2.0
TRCD	7.63	3.38	TriCord Systems	4.13	-0.50	-10.8
UIS	13.61	7.38	Unisys Corp (L)	7.88	0.25	3.3
ADBE	46.50	27.25	Adobe Systems Inc.	32.25	0.00	0.0
AMSWA	8.63	2.50	American Software Inc	7.25	-0.25	3.3
APLX	33.00	9.25	Applix Inc.	18.00	-4.50	-20.0
ACAD	53.00	30.75	Autodesk Inc.	41.25	-2.88	-6.5
BACH	7.88	2.00	Bachman Info. Systems	6.15	-0.13	2.0
BGS	31.50	22.00	BGS Systems Inc.	25.38	-0.63	-1.7
BMCS	31.88	20.50	BMC Software Inc	24.25	-4.00	-8.3
BOOL	31.25	19.88	Boole & Babbage	29.25	-0.75	-2.5
BORL	17.25	6.00	Borland Int'l. Inc.	14.63	-0.38	-2.5
BROC	11.75	3.25	Brodie Control Systems Inc.	7.63	0.38	-4.7
CESN	3.25	1.53	CE Software	2.31	0.44	23.3
CYE	22.00	9.13	Cheyenne Software Inc.	18.63	1.13	-5.7
COGNF	35.50	12.88	Cognos Inc. (N)	32.38	2.25	-0.5
CA	51.75	28.38	Computer Associates	38.00	-3.00	-7.1
CVN	14.38	2.25	Computervision Corp	11.38	-0.75	-6.2
CPWR	69.25	38.25	Computware Corp. (L)	21.00	-1.00	-4.3
CSRE	32.38	20.75	Consware Inc	30.13	0.50	1.7
COSFF	19.50	10.13	Cosa Corp	16.25	-0.13	-0.8
DWTI	16.25	9.00	Database Technologies Inc.	12.25	-0.75	-7.0
FILE	31.00	21.00	Filenet Corp	42.75	-1.38	3.1
DODDF	0.25	3.38	4th Dimension	5.75	-0.13	2.1
FRAM	33.00	13.75	Frame Technology	27.00	0.25	0.9
FTPS	33.50	30.25	FTP Software Inc.	25.25	-3.63	-9.4
GSOF	30.00	8.00	Group 1 Software	11.00	0.00	0.0
GPTA	13.00	8.25	Gupta	8.63	-0.25	2.8
HOGN	13.00	4.63	Hogan Systems Inc.	9.50	-0.25	-2.6
HYSW	58.75	31.25	Hyperion Software Corp (N)	52.50	-2.75	-5.0
IRK	18.63	11.25	Information Resources	13.13	-0.13	-0.8
IFMX	34.38	11.63	Informix Corp	30.13	-2.25	-6.9
INGR	14.00	7.38	Intergraph Corp	11.88	-0.19	-1.6
LEAF	11.00	3.50	Interleaf Inc.	8.88	1.31	-12.9
ISLI	30.25	12.63	Intersolv Inc.	19.38	-1.25	-6.1
INTU	51.25	30.00	Intuit Inc.	45.00	-2.38	-5.0
LGNT	40.25	24.50	Legent Corp	47.25	-0.25	-0.5
MGIC	11.00	3.63	Magic Software Enterprises	7.38	0.00	0.0
MANU	16.75	9.75	Manugistics Group Inc.	13.50	0.00	0.0
MAPS	46.00	16.50	Mapinfo Corp	22.25	1.63	7.9
MATH	7.38	2.00	MathSoft	6.25	0.25	4.2
MCAF	56.50	9.25	McAfee Associates	44.50	-4.38	32.5
MENT	21.38	10.63	Mentor Graphics	20.63	0.13	0.6
MFGY	15.00	10.75	Micro Focus	10.88	-0.38	-3.3
MGXI	13.00	3.00	Microgrex Inc.	10.38	-1.50	-12.8
MSFT	109.25	33.88	Microsoft Corp	87.50	-4.13	-4.5
NETM	27.75	10.00	NetManage Inc.	20.25	-3.50	-14.7
NSCP	74.75	65.75	Netscape Comm. Corp	61.00	-1.25	2.0
ORCL	42.00	26.75	Oracle Corp	38.50	-0.25	-0.6
PMTC	64.25	31.75	Parametric Technology (N)	50.75	1.50	2.4
PARQ	23.25	7.88	ParcPlace Systems Inc	20.25	-0.25	-1.4
PSFT	91.00	22.50	Peoplesoft (M)	84.75	-4.00	-4.5
PTEC	14.38	5.38	Phoenix Technologies	11.31	1.69	13.0
PSQL	16.88	6.50	Platinum Software	9.63	-1.88	-16.3
PLAT	26.00	13.50	Platinum Technology	19.25	-0.50	-2.5
PRGS	70.00	38.50	Progress Software Corp (N)	67.25	0.25	0.4
QDEK	22.13	1.94	Quarterdeck Corp	17.75	-1.50	-7.8
RMBO	26.75	11.13	Rambbo Technologies Inc	18.38	1.25	-6.4
ROPS	10.13	2.00	Rasterops	7.00	-1.75	35.2
ROSS	7.25	3.00	Ross Systems	6.13	-1.00	-14.0
SKEY	51.75	15.00	Softkey International Inc	41.38	3.75	-8.3
SPCO	6.75	2.88	Software Publishing Corp	3.31	1.00	-21.3
SOTA	12.50	5.63	State of the Art	9.75	-0.50	-4.9
SSW	47.50	28.63	Sterling Software Inc.	42.88	-2.62	-5.8
SDRC	20.25	4.83	Structr Dynamics Research	17.25	-1.75	-9.2
SYBS	55.00	12.88	Sybase Inc.	31.63	-0.88	-2.7
SYMC	33.25	14.75	Symantec Corp	27.63	-1.75	-6.0
SNPS	34.50	19.75	SynOpsys	30.75	0.00	0.0
SSAX	45.75	11.38	System Software Assoc.	35.63	-4.94	-12.2
SYSF	18.13	5.50	Systemsoft Corp	13.75	1.38	-9.1
VIEW	24.00	7.88	Viewlogic Systems	13.25	-0.75	-5.4
VMRE	75.50	10.75	VMark Software Inc.	14.63	-0.50	3.3
WALK	9.25	1.63	Walker Interactive Systems	8.50	-0.25	-2.9
WALL	35.50	15.00	Wall Data Inc.	17.00	-0.75	-4.2
WANG	19.50	9.13	Wang Laboratories Inc.	15.25	-0.50	-3.2
AMD	30.25	22.25	Advanced Micro Devices	27.25	2.96	-8.0
ADI	39.50	30.00	Analog Devices Inc.	34.50	-0.88	-2.5
ATML	36.75	14.50	Atmel Corp	32.00	-2.00	-5.9
CHPS	15.88	6.88	Chips and Technologies	13.25	-0.75	-5.6
CRUS	61.13	10.50	Cirrus Logic	32.88	-4.75	-8.2
CY	55.50	15.00	Cypress Semiconductor Corp	35.50	-4.00	-10.1
DIS	24.88	13.38	Dallas Semiconductor	19.38	-0.75	3.7
ISSS	34.25	11.63	Integrated Silicon Systems	24.88	-2.63	-8.9
INTC	78.38	28.75	Intel Corp	60.88	-0.11	-0.2
LSI	42.50	17.25	LSI Logic Corp	31.00	-8.00	-13.4
LSCC	41.00	15.50	Lattice Semiconductor	40.63	1.13	0.3
MKI	94.75	13.25	Micron Technology	74.13	7.38	-9.0
MOT	82.50	49.00	Motorola Inc.	71.88	5.50	-7.1
NSM	33.63	16.38	National Semiconductor	25.50	2.38	-8.5
SEMA	26.75	6.63	Sierra Semiconductor	21.00	-1.12	-4.9
TXN	81.75	12.75	Texas Instruments (N)	74.25	4.75	-8.3
VLSI	38.13	10.25	VLSI Technology	30.63	-4.38	-12.9
WWTR	6.88	1.78	Wavtek	4.44	-0.56	-11.3
WDC	22.13	13.13	Western Digital Corp.	13.88	-0.13	-0.8
XLNX	55.50	15.00	Xilinx	45.50	-3.63	-7.4
ZILG	54.13	17.38	Zilog Inc.	39.25	-2.19	-5.3
APCC	25.88	10.38	American Power Conversion (L)	11.96	-0.03	-5.6
ADPT	47.25	17.25	Adaptec Inc	40.00	-2.88	-6.7
BTEC	27.25	14.75	Bantec Inc.	20.00	-2.00	-9.1
CBEX	13.13	3.38	Cabletron Corp	9.94	1.81	-10.4
CGN	6.38	1.38	Cognitronics Corp.	4.63	-0.38	-3.9
CNR	19.25	9.38	Connect Peripherals	16.88	0.13	0.7
CREAF	18.31	5.00	Creative Technologies Inc.	12.46	1.00	7.9
RACE	13.13	3.50	Data Race Inc	4.13	-0.50	20.0
DTMI	9.38	4.25	Dataram Corp	7.38	-0.50	-6.3
EMC	37.38	14.75	EMC Corp	27.25	-1.00	-3.5
EMUL	18.50	6.88	Emulex Corp	13.50	-0.38	-2.7
ESCC	20.00	11.25	Evans & Sutherland	18.00	-0.06	-0.3
EXBT	24.00	10.00	Exabyte	12.00	-1.19	-9.0
ISLS	4.25	1.88	Intelligent Info. Systems	2.81	0.13	4.7
IOMG	30.00	2.88	Iomega Corp	19.00	-4.00	-17.4
IPLSA	7.88	2.00	IPL Systems Inc.	3.88	0.13	3.3
MAG	74.88	22.25	Komag Inc.	58.38	-7.25	-11.0
MXTR	7.25	2.63	Maxton Corp.	4.44	-0.13	-2.7
MU3	11.50	4.00	Micropolis Corp	3.25	-0.38	-8.7
PMCL	23.75	8.75	Pinnacle Micro Inc.	13.75	-0.63	3.2
PTNX	38.75	17.25	Pyramma Inc	27.25	-2.00	-6.7
AQM	50.00	6.00	QMS Inc	6.75	0.25	5.6
QNTM	36.50	13.75	Quantum Corp.	18.75	3.13	-14.9
ROIU3	15.00	6.50	Radius Inc. (L)	6.50	-0.38	-5.5
REC	12.63	5.50	Recognition International (N)	11.00	-1.38	-11.1
SEG	69.38	22.88	Seagate Technology	60.38	-2.00	-4.7
STK	33.25	17.88	Storage Technology	29.25	-1.50	-4.9
TEK	59.38	31.38	Tektronix Inc. (N)	52.00	-1.63	-3.8
XRX	135.38	90.63	Xerox Corp (N)	129.00	-5.50	-4.1
AMSY	28.00	15.00	American Mgmt. Systems	25.25	1.25	-4.7
AAC	3.00	0.50	Anacomp Inc.	0.63	0.00	0.0
ANLY	33.00	17.25	Analysts Int'l.	32.00	0.00	0.0
AUD	70.88	38.75	Auto Data Processing	68.88	0.13	0.2
CATP	52.75	14.00	Cambridge Tech. Partners (N)	48.25	-2.25	-4.5
CEN	46.88	35.50	Cendian Corp.	44.50	1.13	2.6
COO	32.50	19.38	Comdisco Inc.	29.75	-0.25	-0.8
CNRZ	23.75	7.75	Computer Horizons	18.50	-1.75	-8.6
CSC	65.38	41.50	Computer Sciences (N)	64.88	0.25	0.4
TSK	16.13	7.50	Computer Task Group	16.88	0.00	0.0
CPU	64.38	9.50	CompuSa Inc	61.50	-1.13	2.6
CDAT	12.50	5.38	Control Data Systems Inc. (N)	11.50	-0.19	1.6
EGGS	14.25	6.63	Egghead Discount Software	8.38	0.25	3.8
GME	47.50	34.75	General Motors E (EDS)	46.00	-0.25	-0.5
IMAC	13.25	0.88	Imacon Corp	11.38	-2.13	-15.7
INEL	17.13	7.50	Intelligent Electronics	7.88	-1.50	-7.4
MSEL	10.75	3.88	Megasel	3.94	-0.19	-3.1
MICA	15.50	8.50	Micropage Inc	50.25	-0.50	4.4
PAYX	47.00	33.25	Paychex (N)	46.38	-0.88	1.9
PMS	54.25	37.25	Policy Management Sys	46.88	-4.25	-8.3
REY	36.63	32.25	Reynolds and Reynolds	33.00	1.13	3.3
SEIC	24.50	16.75	SEI Corp	19.25	-0.75	3.7
SMED	42.75	25.38	Shared Medical Systems	44.25	0.25	0.8
SMKF	13.00	6.00	SHL Systemhouse	12.63	0.13	1.0
SSPE	26.50	12.50	Software Spectrum Inc.	23.50	1.13	-4.6
SNDT	31.75	16.88	Sungard Data Systems	30.25	-1.00	3.4

KEY: (H) = New annual high reached or period (L) = New annual low reached in period

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ENCORE
COMPUTER CORPORATION

THE FUTURE BELONGS TO A HIGHER INTELLIGENCE.

Cascade splits switch management, adds tools

By Patrick Drydee

Cascade Communications Corp. plans to introduce a multiserver version of the management software for its wide-area network switches at its annual user coeference this week in Boston.

Service providers and large organizations responsible for extensive WANs will see CascadeView 2.0. The software offers a distributed design and six eew functions to help manage more switches and virtual circuits carrying higher traffic at increased speeds. The Unix-based software runs alone on management servers or with other network tools on top of Hewlett-Packard Co.'s OpenView.

"Now their anified management software can scale across several muitifunctioe servers, so users with big-time backboees can spread tasks among a large staff to keep up with growth and change — like the migration to ATM," said Tim Wilson, a management analyst at Decisis, Inc. in Herndon, Va.

CascadeView's new client/server architecture means Bell Atlantic Network Services, Inc. can contain management costs and make better use of its network control centers, said Ray Beares, senior manager for fast-packet services at Cascade in Westford, Mass.

New server fuections help users cope with the demands of growing WANs. For instance, the Health Checker server combines usage and tariff data to help planners analyze performance and cost as they model network improvements. One beta tester was able to cut recurring costs from $200,000 to $50,000 by funneling traffic from sites throagh public frame-relay connections, said Steve Kelly, product director at Cascade.

Prices for CascadeView 2.0 range from $3,000 to $15,000 for stand-alone servers. The basic network management system costs $25,000.

Frame relay is growing heyond its original charter. See page 69.

Computer Associates to hike fees

CONTINUED FROM COVER t

mainframe software bill.

"I doe't think [the CA rep] would have givee me an early warning flag if it wasn't a significant change," said Tucker, who left Key Services last week to become chief information officer at the U.S. Federal Reserve System in Richmond, Va.

The fee increases — coupled with the impact they would have oe maintenance costs — could drive some users into the arms of competitors, judging from interviews with some CA customers last week. Depending on the percentage increase in the fees and the size of their systems, CA customers could see their bills jump by tens of thousands of dollars annually.

Yet sources close to CA said most customers will hardly feel the pinch of price increases that are more likely to fall under t0%.

Any kind of fee increase will be bad eews for Ames Department Stores, Inc., where scraggly IS budgets and a stingy retail climate are weighing heavily on the IS division. "If this means we'll have to reassess the [CA] products we're running, we'll do that," said Steven Skiba, vice president of computer services at the Rocky Hill, Conn.-based departmeet store. Ames runs CA-1, CA-7 and CA-tt mainframe utility software.

In fact, Skiba said CA's fee increases could lead Ames to pay a little more attention to 4th Dimeesion Software, Inc., a Costa Mesa, Calif., vendor that has made repeated offers to replace the retailer's CA applications. "Bet we wouldn't want to switch if [cost and functioeality] were eqaal," Skiba eoted.

Roaming eye

Another customer site — Spiegel, Inc. — pays aboat $180,000 to lease its IBM DB2 database software each year, while another $250,000 goes to CA for its CA-IDMS software, said Nick Iozzo, a technical services manager at the Downers Grove, Ill., retailer and distributor.

Iozzo once winced at the $3.5 millioe to $5 million price tag a developer quoted him for a conversion of Spiegel's IDMS files to DB2. But as Spiegel consolidates its mainframe activities, Iozzo said he sees less reason to run both mainframe databases.

CA's fee increases could lead him to reconsider the coeversion project as a viable option, he said. He added that he hadn't been briefed by CA on the price hikes yet and didn't know how much Spiegel's mainframe software fees might increase.

Under the CPU-based or tiered pricing model for mainframe software, software prices are determined by the size or class of the processor it runs on. An IBM Group 80 system, for example, is classified by most independent software vendors at 215 to 265 MIPS.

On the way up

More than t0 of Gartner Group, Inc.'s software asset management service clients were told by their CA reps that their mainframe licensing fees would increase by 8% or more and that the rate hikes would be made across the board, according to Karee Cone, a research director at the Stamford, Conn.-based research firm.

There is, however, a silver lining for some high-end Legent Corp. licensees. CA plans to reduce the rates some Legent customers have beee paying to a lower level, thereby offering them as mech as a 5% discouet on CA's annual license and maintenance fees.

Analysts say CA is invoking the price hikes to lure its tiered licensees to multiyear, enterprise licensing deals in an effort to bolster its recurring-reveeae stream.

CA's planned price hikes won't affect the University of Miami in Coral Gables, Fla., because it signed a five-year enterprise software license last year that limits the size of the aneual increases CA can slap on its mainframe software.

M. Lewis Temares, vice president of information resources at the school, said CA is probably testing the waters with customers before deciding on and then publishing its rates later this month.

BIG IRON BUMP

TYPE OF SOFTWARE	PRICE INCREASE*
Single CPU mainframes	6% to 8% (10% to 12% with older software versions because of premium maintenance charges)
Multiple CPU machines	11% to 15%
IBM Group 90 or Group 100 processor, single CPU	17% to 25% (depending on upgrade)
Multiple IBM Group 90 and/or Group 100 processors	15% to 20%

Source: Meta Group, Inc., Stamford, Conn.

In the majority

Even though CA introduced alternative pricing mechanisms in 1992, including MIPS-based pricing, approximately 75% of CA's mainframe customers continue to license their CA software using the traditional tiered pricing model, said Karen Cone, a research director at Gartner Group, Inc. in Stamford, Conn.

Unicenter drops prices

While some CA mainframe software customers are simmering over the vendor's planned price hikes, CA-Unicenter users seem downright tickled about CA's plans to dramatically lower the entry point for the systems management software.

The vendor plans to slash Unicenter pricing for desktops and low-end servers for the second time in the past year, *Computerworld* has learned [CW, Aug. 29, 1994].

Smaller shops that use Unix servers with four CPUs or fewer will be able to purchase Unicenter server software for $400 per power unit vs. the $700 per power unit CA had charged, according to analysts briefed by CA recently. CA uses what it calls "power unit" pricing for software that runs on, say, a 120-MHz Intel Corp. Pentium processor.



Roberts Express' Joseph Grealich *is considering Unicenter*

This model won't apply to Microsoft Corp.'s Windows NT, however, because Unicenter is already being bundled in with each copy of NT.

Analysts said shops with larger Unix machines and mainframe systems will also benefit from Unicenter discounts, albeit on a smaller scale than shops with less-powerful machines. Low-end Unix shops could see 40% price/performance improvements through discounts and added functionality, said Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

New Unicenter features include Legent's AgentWorks intelligent agent server software, which CA will bundle into Unicenter at no additional charge, according to analysts briefed by CA.

Those perks appeal to Joseph Grealich, director of MIS at Roberts Express, Inc., an Akron, Ohio, subsidiary of Roadway Services that specializes in emergency freight handling. CA "needed to bring down the [Unicenter] entry point, but we're going to have to wait to see what Roadway decides," Grealich said. His unit is considering using Unicenter to help manage its two eight-processor Sequent Computer Systems, Inc. S8000 Unix machines.

By lowering the entry point on Unicenter once again, CA is expected to grab an even bigger piece of the distributed systems management market. "More functionality, lower price — it's a pretty compelling reason to use their product," said Jack Maynard, a senior analyst at Aberdeen Group, Inc. in Boston.

— Thomas Hoffman

It's easy to overlook NT Workstation's strengths

Charles Babcock

Microsoft's Windows NT has two faces: NT Workstation and NT Server. Understanding the differences between the two is one way to weigh a move to Windows NT against an intermediate migration to Windows 95.

NT disappointed many observers when it came out of the blocks because they expected it to be a big brother to Windows, selling in the millions to upgrade-minded power users. When it didn't, it was pronounced a laggard in the overall Windows blitzkrieg.

Out of the limelight, however, NT quietly and effectively went to work, proving to be a match for Novell's NetWare and offering special qualities in group security and system management. With the addition of the BackOffice suite, NT became a powerful manager of PCs and PC LANs. One of its few challengers was any group of products laboriously assembled by IS managers from various third parties.

The fact that NT's growing strength has gone unnoticed lays bare the lack of popular concern for infrastructure. Are thousands of PCs being added to your organization a year? Yes? And, like, how fast do they run Doom?



The fact that NT's growing strength has gone unnoticed lays bare the lack of popular concern for infrastructure.

The ability to configure and manage PCs will be a decisive issue for IS as it tries to reassert some authority over its burgeoning population. To many, it seems unlikely that the operating system of choice for accomplishing that will also be suitable for the desktop. But consider the following:

- Windows NT Server requires 16M bytes of memory. NT Workstation requires 12M bytes — just four more than Windows 95 does. Memory costs money, but so do operating system migrations. NT Workstation uses less memory than NT Server because NT Server must use caching and page faulting techniques that hold the most recent activity in RAM. The most recent activity often holds the most frequently accessed data and instructions.
- NT Server is optimized to process multiple background server applications. NT Workstation is optimized to process users' foreground applications. Both support high rates of I/O.

What does NT Server have that NT Workstation lacks?

- File and print services for the Macintosh.
- A NetWare gateway.
- Capacity to deal with 256 remote users.
- Built-in disk mirroring and RAID 5 support.
- User management and domain administration tools that provide directory services.

The single-user desktop doesn't need these things.

NT Workstation and NT Server have the same kernel architecture. The actual kernels look slightly different because they are compiled differently, based on parameters set to optimize the functions intrinsic to their respective roles.

It isn't surprising that an operating system that resembles two of its predecessors — Unix and Digital's VMS — should be reconfigurable from a server to a desktop system. VMS was a step forward from IBM's MVS as an end-user, time-sharing system. For a batch processor such as the early MVS to time-share, users needed a transaction processing monitor; that's something like adding an automobile engine to a carriage to make a car. Unlike with MVS, the same VMS architecture could be optimized to various priorities.

Windows NT has carried the concept another step forward. NT is written in C and can be moved to different hardware platforms, such as Unix. With its microkernal design, many system services lie outside the kernel and can be dropped from a desktop version, scaling down its bulk.

NT Workstation will run 16-bit applications slower than Windows will because they are executed in a 16-bit virtual machine inside NT. But the same is true for Windows 95.

The price per seat is also higher for NT Workstation than for Windows 95 (listed at $319 vs. $199), but corporate buyers could pay closer to $100 and $50 and may find the NT Workstation price is closer to the Windows 95 figure if they negotiate.

The financial barriers to NT Workstation are low, especially when users consider the need to migrate there eventually. And the advantages of dealing with a single, manageable PC operating system will eventually outweigh any higher initial cost.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

Inside Lines

Talk about your domain-eering firms

Big consumer-goods firms have gobbled up a broad array of Internet domain names to make sure they aren't taken by interlopers. Kraft General Foods and its units have registered at least 150, including coolwhip.com, sanka.com, cheezwhiz.com and velveeta.com. Kraft also snapped up such generics as hotdogs.com and even frozendinners.com. Similarly, Procter & Gamble has registered more than 60 domain names, including such charming addresses as headache.com, antiperspirant.com, pimples.com, bacteria.com, toiletpaper.com and dandruff.com.

Spectrum rollout imminent

Cabletron Systems is finally launching the full beta of Version 4.0 of Spectrum distributed network management software following delays to ensure that new distributed alarm and reporting functions would work with a compressed database format. This version will run on Microsoft's Windows NT as well as the leading Unix platforms and will give administrators an enterprisewide view of their networks instead of a domain by domain focus. Formal introduction is set for next week.

'scuse me, pardon me, comin' through

Open Market, an Internet software maker in Cambridge, Mass., plans to announce a Web server next week that will compete head-on with Netscape's Commerce server, according to a source close to Open Market. Although several vendors have put out Web servers aimed at users who want to do business on the Internet, Open Market thinks it has something special: a lower price. The server is expected to cost at least a few hundred dollars less than comparable products from Netscape, the source said.

Trick or treat, database-style

Sybase plans to unveil Sybase System 11, a rewrite of its basic database management system, at a global press conference Oct. 30 in New York. Sybase has worked hard to get Sybase 11 out the door since the 1992-vintage System 10 was blamed for lagging performance on high-end symmetrical multiprocessing systems and slowed sales [CW, April 17].

Wire me up, Scotty

Ameritech Cellular Services is negotiating with ARDIS and RAM Mobile Data to resell those companies' wireless data transmission services in some markets. Such a move would raise eyebrows in the wireless world because Ameritech is a provider of Cellular Digital Packet Data (CDPD) wireless communications, a rival technology of the radio transmission protocols provided by RAM and ARDIS. But a spokeswoman for Ameritech said the move makes sense in the absence of a nationwide CDPD network.

How can an IS manager get to run a company when the top spots are usually roped off from the computer folks? Well, hitting a $23.4 million jackpot doesn't hurt. Meg Shatos, director of MIS at Haemonetics Corp. in Braintree, Mass., did just that last week, winning big in a Massachusetts Lottery jackpot on her 30th birthday. We here at Computerworld *would be happy merely to hit a jackpot of news tips. If you have one, contact us through our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at maryfran_johnson@cw.com.*

The 5th Wave by Rich Tennant



"Yes, it's wireless, and yes, it weighs less than a pound, and yes, it has multiuser functionality... but it's a stapler"

Enjoy The 5th Wave? *Look for Rich Tennant's new book,* Version 2.0, *or call publisher Andrews & McMeel at (800) 642-6480.*

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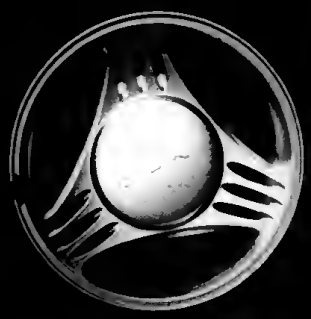
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The Premier 100

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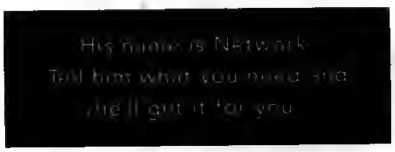
CHARLES E. PERUCHINI, director of IS at top-ranked Superior Industries International, Inc



REVVING UP INFORMATION PRODUCTIVITY THROUGH
RE-ENGINEERING • OUTSOURCING • CLIENT/SERVER

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THE NETWORK IS THE COMPUTER™

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Alan Levenson

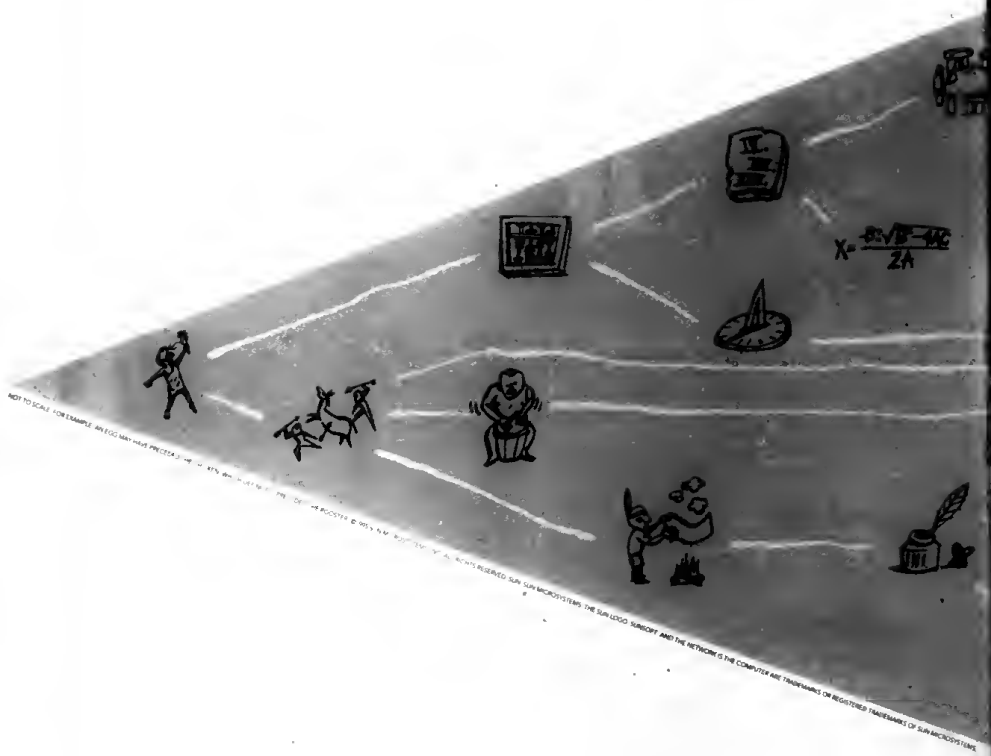
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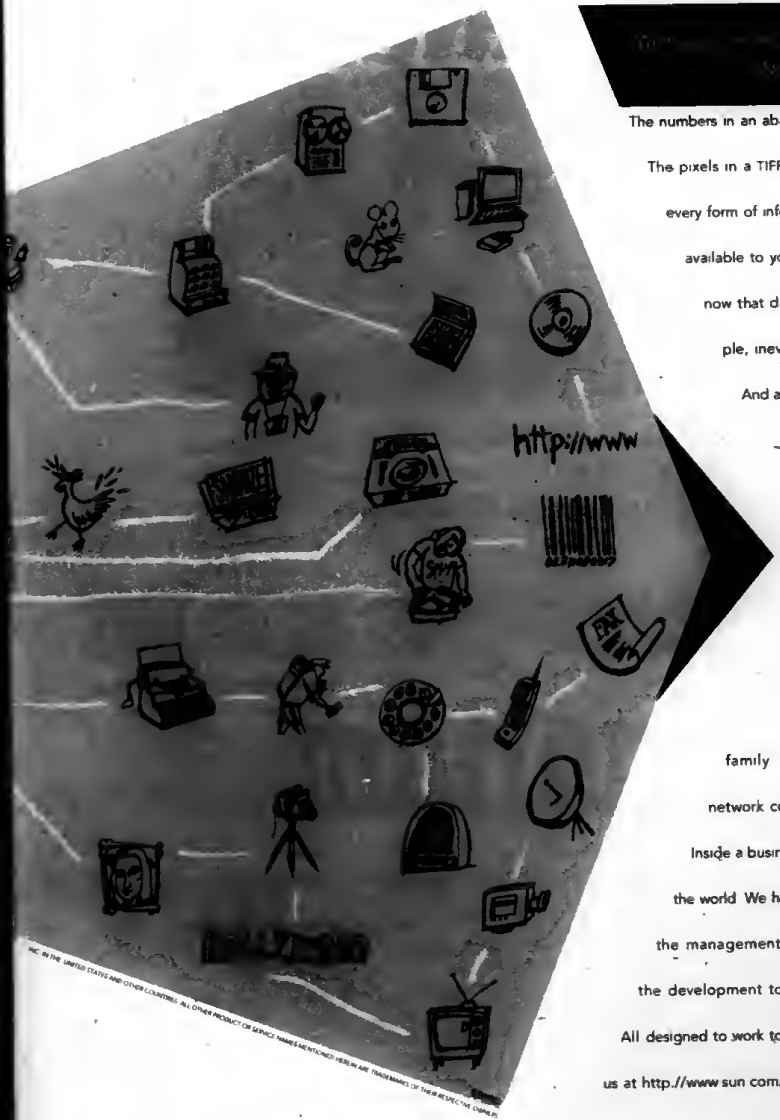
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The **Premier 100**

Companies are listed by ranking within each industry

Apparel, Textile & Furniture
- Galey & Lord, Inc
- Chromocraft Revington, Inc
- St. John Knits, Inc

Chemical Manufacturing
- Great Lakes Chemical Corp.
- Ethyl Corp.
- ARCO Chemical Co.

Diversified Services
- HealthCare Compare Corp.
- First Data Corp
- Kinetic Concepts, Inc
- CBS, Inc.
- Equifax, Inc.

Electric & Gas Services
- AES Corp.
- Destec Energy, Inc.
- California Energy Co.

Electronic & Electric Equipment
- BMC Industries, Inc
- Vicor Corp
- Solectron Corp.

Financial Services
- Mercury Finance Co
- Western National Corp.
- John Nuveen Co.
- Green Tree Financial Corp
- Morgan Keegan, Inc
- The Bear Sterns Cos
- The Equitable of Iowa Cos.
- Boston BanCorp
- A.G. Edwards, Inc
- T. Rowe Price Associates, Inc
- Valley National Bancorp
- Morgan Stanley Group, Inc.
- Progressive Corp.
- The Charles Schwab Corp.
- Charter One Financial, Inc.
- Arthur J. Gallagher & Co.

Food & Beverage
- The Coca Cola Co.
- Wm. Wrigley Jr. Co.
- Cagle's, Inc
- Anheuser-Busch Cos.
- Campbell Soup Co.

Food Services
- Outback Steakhouse, Inc.
- International Dairy Queen, Inc.
- McDonald's Corp.
- Applebee's International, Inc.

General Building Contractors
- Champion Enterprises, Inc.
- Toll Brothers, Inc.

Health Services
- United HealthCare Corp.
- U.S. Healthcare, Inc.
- Health Management Associates
- Vencor, Inc.
- Express Scripts, Inc.

Manufacturing
- UST, Inc.
- Chase Brass & Copper Co.
- Adams Resources & Energy, Inc.
- International Game Technology
- Medusa Corp.
- Southern Energy Homes, Inc.
- WMS Industries, Inc.
- Fossil, Inc.
- Int'l Flavors & Fragrances, Inc.
- CMI Corp.
- Electroglas, Inc.
- Arrow International, Inc.
- Worthington Industries, Inc.
- Rubbermaid, Inc.
- Martin Marietta Materials, Inc.
- Sunbeam-Oster Co.

Paper & Paperboard
- Louisiana-Pacific Corp.
- Wausau Paper Mills, Co.
- Caraustar Industries, Inc.

Pharmaceuticals
- Alza Corp.
- Mylan Laboratories, Inc.
- Amgen, Inc.
- Abbott Laboratories
- Merck & Co.
- American Home Products Corp.
- Schering-Plough Corp.
- Bristol-Myers Squibb Co.
- Eli Lilly & Co.

Printing & Publishing
- Marvel Entertainment Group, Inc.
- Gannett Co.

Recreational Products & Services
- Carnival Corp.
- King World Productions, Inc.
- Topps Co.
- Royal Caribbean Cruises Ltd.

Transportation & Industrial Equip.
- Superior Industries Int'l, Inc.
- Wabash National Corp.
- Clark Equipment Co.
- Cooper Tire & Rubber Co.
- Breed Technologies, Inc.
- Masland Industries
- Stewart & Stevenson Services, Inc.
- Supreme Industries, Inc.

Transportation Services
- Arnold Industries, Inc.
- Illinois Central Corp.
- Norfolk Southern Corp.
- Rollins Truck Leasing Corp.
- Swift Transportation Co.

Wholesale/Retail
- TBC Corp.
- Nine West Group, Inc.
- Ellett Brothers, Inc.
- Audiovox Corp.

EXECUTIVE SUMMARY



INFORMATION MANAGEMENT, NOT INFORMATION TECHNOLOGY, IS THE KEY TO SUCCESS FOR COMPUTERWORLD'S PREMIER 100

BY SRUCE RAYNER

Management matters

Take a close look at the list on the facing page.

The 100 companies listed here are some of the best managers of information in the country.

As expected, there are a number of recognizable big names in virtually every industry: Merck & Co. in pharmaceuticals, The Bear, Stearns Cos. in financial services and McDonald's Corp. and Coca-Cola Co. in food and beverages, to name a few. In all, 36 billion-dollar companies made it onto the *Premier 100* list, 19 of which are in the *Fortune 500*.

While you might expect to see more large corporations in the *Premier 100*, big is not always better. Indeed, companies with sales below $1 billion make up the bulk of the list. Of the Top 10 companies on the list, seven have sales below $750 million. In all, 14 companies on the

Continued on page 8

Illustration by Joe Flaming

Continued from page 7

Premier 100 list have sales below $200 million. (For a look at the small vs. large issue, see "Information Entrepreneurs" on page 20.)

Why such a wide bandwidth in company size? Because the *Premier 100* attempts to capture a company's ability to manage information, not the size of its information systems budget.

PRODUCTIVITY PARADOX

A company can spend huge sums on IS and still not improve its business performance. Indeed, the direct connection between IS spending and productivity (additional output derived directly from an investment) in the aggregate has proved illusive. Known as the "productivity paradox," the connection between IS spending and increased output still inspires heated debate.

Even establishing a link between technology breakthroughs and productivity improvements is tenuous. Just look at the timeline at the bottom of this page. With productivity leveling off in the mid-1970s, a causal relationship between technology and productivity would be hard to defend.

Of course, there's a difference between productivity at the macroeconomic level and productivity at the company level. For the economy, myriad other factors must be taken into account, such as the general health of the economy and political machinations. At the company level, these things play a role, but to a lesser extent. Again, productivity depends not on the size of the IS budget or whether a company uses state-of-the-art technology, but on how the company manages information and information technology.

For a lesson in management savvy, consider Superior Industries International, Inc., this year's top-ranked *Premier 100* company. Hardly a household name, the $456 million Van Nuys, Calif.-based maker of alloy wheels has been growing at 15% per year for the past few years as a result of some very lucrative deals with the big auto makers. (For details, see "Superior Performance" on page 12.)

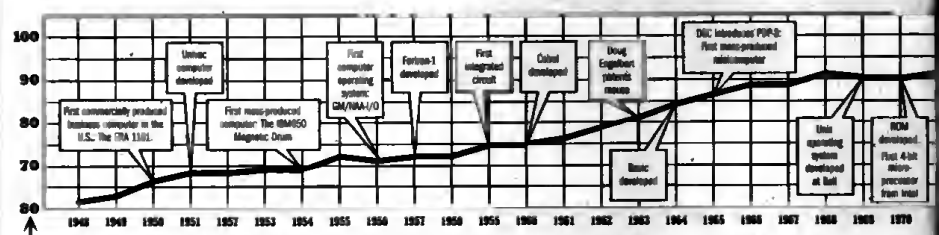
Admittedly tightfisted, Superior spends very little on information technology, typically less than one-half of 1% of gross sales. But what the company does spend, it spends wisely, according to E. Jane Sinemma, an analyst at Kemper Securities Equity Research in Chicago.

Sinemma cites Superior's investment in IT as typical of its "outstanding management team and keen strategic vision." Superior's recent expansion in data-processing capability "supports Superior's intensive efforts to make its own processes even better," she says.

Re-engineering

Among Premier 100 companies surveyed, retraining (57%) and employee resistance to change (50%) are the biggest obstacles to successful re-engineering projects. But despite the risks, 93% are doing some form of re-engineering. **See page 32.**

What's the connection between productivity



Combined labor and capital productivity index for the nonfarm business sector, base year 1987

NUMBER CRUNCHING

Superior is in the middle of the road when it comes to IS spending among the *Premier 100*. In aggregate, the 100 companies spend an average of 2.6% of revenue on IS. What's more, their IS spending was up a significant 12.8% this year. (By comparison, a 1995 CSC Index survey of 640 companies in North America found that IS spending averaged 2.1% of revenue, and the average annual increase in spending was 4.6%.)

Of the 18 industries represented in the *Premier 100*, the manufacturing sector spent the most on IS last year, averaging 8.9% of revenue. Financial services, too, is a relatively big spender, averaging 6.4% of revenue spent on IS. On the other end of the spending spectrum are building contractors, which spent a meager 0.2% of revenue on IS.

As for growth, building contractors posted the highest year-to-year growth in IS spending: 38%. This might be explained by the relatively strong growth of the economy and the corresponding strength in the construction sector. Following close behind is the food-service sector, with a growth rate of 21%. Health services and pharmaceuticals, both fiercely competitive industries, tie for third with a growth rate of 18%.

WHERE THE MONEY GOES

Of course, IS spending and spending growth say nothing about who spends the money and how it is spent.

Despite talk of decentralizing the IS function, IS budgets at the *Premier 100* companies remain centrally controlled. In all, 79% of IS spending is managed by centralized corporate IS managers, while 13% is controlled by divisional or functional IS managers. Only 8% of the aggregate IS budget is managed by non-IS managers.

Few companies on the list stray from the norm, with the notable exception of second-ranked AES Corp., which lets non-IS managers control 80% of IS spending. (See "The Rest of the Best" on page 16.)

As for how the money gets spent, virtually all *Premier 100* companies spend something on business process re-engineering, client/server and outsourcing. Overall, 27% of all money spent on re-engineering goes to IS. In some industries, such as printing and publishing, transportation services and recreational products and services, the figure rises above 70%. (See "Revamp Champs" on page 32.)

Likewise, the vast majority of *Premier 100* companies spend significant IS dollars on client/server technology and outsourcing. On average, 20% of their IS budgets goes to

Continued on page 10

Client/Server

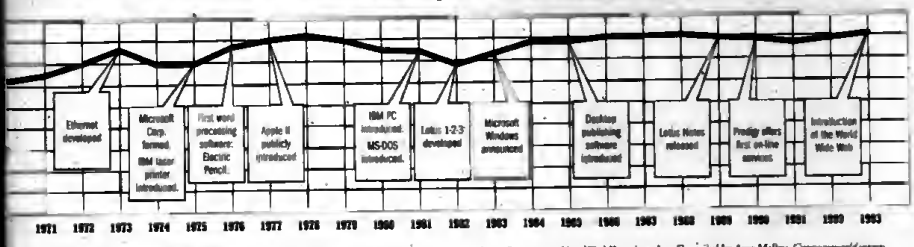
The complexity of the multivendor environments (57%) and the lack of trained personnel (55%) are the most serious problems Premier 100 companies face as they implement client/server. See page 27.

Outsourcing

Most Premier 100 companies surveyed say they opt for outsourcing because it gives them access to additional resources (52%) and expertise (50%). See page 35.

and technology?

Since 1977, productivity has leveled off, despite rapid technological advancements. In the aggregate, there appears to be no connection. At the company level, the connection depends on management.



Source: Productivity index: U.S. Bureau of Labor Statistics, Department of Labor; Timeline facts: *Computerworld* and TechKnowledge, Inc. Compiled by Amy Malloy, *Computerworld* intern.

Continued from page 9

client/server projects, while 10% goes to outsourcing contracts. Spending is up this year for both client/server and outsourcing by 45% and 22%, respectively.

Big client/server spenders include No. 63 Ethyl Corp., which spends 90% of its IS budget on client/server, and No 91 Solectron Corp., which spends 60%.

Companies with sales below $500 million spend slightly more on average on client/server than larger companies: 21% vs. 19%. One explanation could be that smaller companies are more willing to go the client/server route because they have less to lose by replacing legacy systems (See "No Pain, No Gain," on page 27.)

As for outsourcing, there is a clear spending differential between large and small companies. Companies with sales below $500 million spend an average of 15% of their IS budgets on outsourcing, while companies with sales over $1 billion spend 8% (See "Make or Buy?" on page 35)

HUMAN CAPITAL

Not surprisingly, spending on re-engineering, client/server and outsourcing are driven by the same thing: the need to tap human capital for competitive advantage.

The number one benefit of re-engineering identified by the 56 *Premier 100* companies surveyed was improved decision making (read: increased management productivity.) For client/server, the number one benefit was the increase in end-user autonomy (read: increased business-unit productivity). And for outsourcing, the most commonly mentioned benefit was access to additional resources and expertise (read: increased IS department productivity).

Likewise, the biggest impediments to success cited by survey respondents were people-related issues: retraining in the case of re-engineering and a lack of trained personnel in the case of client/server.

The message is clear: Without the right people to manage IS, even the best-laid business plans will die on the vine. That's what distinguishes the *Premier 100* from the also-rans. The *Premier 100* are adept at managing the people who manage the information, which in turn creates value. **100**

Raynor is *Computerworld*'s editor of special projects.

How we rank the Premier 100

Computerworld's ranking of the *Premier 100* is based on a three-year moving average of IS Consultant Paul Strassmann's Information Productivity Index (IPI). A more refined measure than IT spending or installed base, the IPI measures a company's effectiveness at managing information.

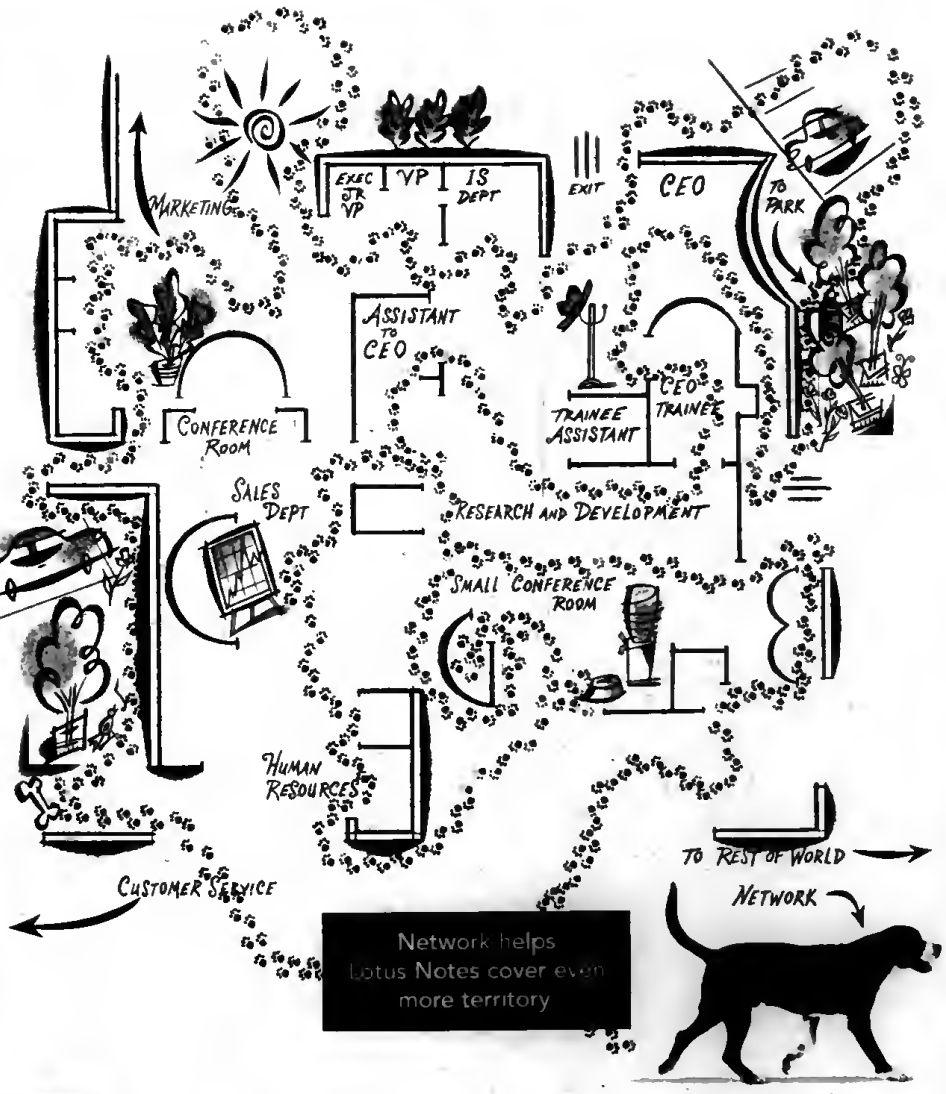
The IPI is like any productivity measure in that it has an output in the numerator and an input in the denominator. The output measures management's contribution to the company, namely its economic value-added (EVA); either Stern, Stewart & Co.'s EVA or the numerator in the formula below. The input represents the management cost of doing business. Unlike last year, this year's denominator included research and development costs because R&D is considered a significant management cost of doing business.

Also new this year, *Computerworld* used a three-year moving average of the IPI to rank the *Premier 100* instead of a single-year figure. This is because some firms show wide swings in profit from year to year. Any company with a significant negative IPI in fiscal year 1992, 1993 or 1994 was excluded from consideration as was any company that reported both favorable operating profits after taxes and large accounting write-offs. In addition, to qualify for the list, companies had to have a fiscal year 1994 IPI of 0.20 or greater.

Computerworld considered companies with sales of more than $100 million for inclusion. However, if a company was unwilling to provide detailed IS information, *Computerworld* reserved the right to exclude it from consideration. All data used to calculate the IPI are publicly available.

$$\frac{\text{Operating profit after tax - (Shareholder equity x Cost of capital*)}}{\text{Sales, general and administrative costs + Research and development expenses}}$$

*COST OF CAPITAL: 1992: 11.3%, 1993: 10.4%, 1994: 11.8%





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Superior



SUPERIOR INDUSTRIES' Peruchini-ID changes may not always be obvious, but they all influence the bottom line

THE TOP FIVE

performance

IN THE FAST LANE, THIS YEAR'S NUMBER 1 PREMIER 100 COMPANY EXCELS WITH MINIMAL IS INVESTMENT

BY ALAN R. EARLS

Square one.

That's where **Superior Industries International, Inc.**'s director of information systems, Charles E. Peruchini, says he began when he joined the top-ranked *Premier 100* company back in 1989.

"It was the best of times, and it was the worst of times," Peruchini says with a laugh.

It was the best of times because the Van Nuys, Calif.-based company was riding the crest of the alloy wheel wave. Shipped on only 4% of new cars in the U.S. in 1980, today alloy wheels are standard equipment on 40% of domestic cars and light trucks, says Jeff Ornstein, chief financial officer. Superior, which makes the lion's share of these wheels, as well as a number of other accessories for the auto market, has seen revenue rise dramatically, nearly doubling from $267 million in 1990 to $456 million last year. Net income has more than quadrupled from $12 million to $56 million over the same five years.

Number 1

From one small plant in Van Nuys, Superior has built a string of newer and larger plants, mostly across the Midwest,

Continued on page 14

Photograph by Elias Sorensen

Continued from page 13

over the past decade. Today, the company can produce some 12 million wheels a year compared with fewer than 8 million at the beginning of the decade. "With all the different models we produce, we operate normally at about 80% of our theoretical capacity," Ornstein says.

Soon a new Superior plant in Hungary will begin to serve the European market, he adds. Worldwide employment has risen from 2,000 in 1990 to 5,000 today.

It was the worst of times because Superior's various functional areas and geographical locations were operating incompatible and arguably inadequate information systems. The bottom line: The alloy wheel market leader's IS infrastructure was ill-equipped to deal with growth.

During the 1980s, Peruchini's predecessors had acquired a string of IBM mainframes culminating in an IBM 4300. The machine handled payroll, billing, orders and general ledger tasks. "Everyone in IS thought things were fine," Peruchini says.

However, the folks in manufacturing thought differently. Peruchini recalls one meeting with manufacturing executives in which everyone took turns bashing IS for poor support. Peruchini used the meeting as a forum to clear the air and to reestablish respect for IS.

Not that there weren't legitimate gripes, he admits. "Areas like manufacturing had gotten tired of waiting for answers from IS, so they had gone off and built their own systems on stand-alone PCs," he explains.

For Peruchini, a veteran of Beatrice Foods, the balkanization of his domain added to the problems he was finding within the department itself — in particular an aging suite of software from the 1960s and 1970s. "We had an order-entry system custom developed by Arthur Andersen," Peruchini says, "but it turned out no one understood or knew how to use much of its functionality."

In some manufacturing plants, he notes, there was almost no computerization at all. Often plant managers got by with one or two stand-alone PCs to handle basic accounting tasks. In short, Peruchini had inherited an operation with no cohesive IS strategy.

"We definitely believe we are doing a lot with a little, and we are proud of it."

CHARLES PERUCHINI
Director of IS
Superior Industries International, Inc.

WINNING SUPPORT

Fortunately for Peruchini, few managers in the company were opposed to change. It helped, too, that early in the process Peruchini was able to get the support of company founder and chairman, Lou Borrick. A tight-fisted, bottom-line manager, Borrick appreciated the efficiency implications of an improved IS system.

In the early days, Peruchini prepared to do battle with Borrick to defend his plans for investing in IS. At one pivotal meeting in August 1991, Peruchini warned of Superior's islands of automation and argued that without a stronger IS infrastructure, the company's robust growth could be stopped cold. For dramatic effect, Peruchini showed Borrick a photograph of the piles of paper that stood outside his office — monuments to incompatibility and inefficiency.

Impressed, Borrick gave Peruchini the go-ahead to develop and plan for the introduction of an AS/400, but, "I made sure he understood that without other changes, just getting the new computer wouldn't accomplish much," Peruchini says.

One of Peruchini's goals was to enhance communication across the company, which now included three satellite plants, while laying the groundwork for an efficient, expandable IS system.

"From 1991 to the present we ended up spending just under $2 million on new equipment and software," Peruchini adds. Furthermore, all IS expenditures annually total less than one-half of 1% of gross sales. "If we ever had 1% to spend, I just don't know what we would do," he says jokingly.

BUILDING BLOCKS

In January 1992, the AS/400 arrived along with BPCS — Business Planning and Control System software sold by Systems Software Associates, Inc. in Chicago. This was the beginning of a system that came to include some 400 PC clones, color printers, electronic data interchange (EDI), bar coding and applications such as Lotus Development Corp.'s 1-2-3 and Bloc Publishing's FormTool. At each step Peruchini maintained buy-in from Borrick and showed him he was focused on the company's financial performance goals — not on an IS-generated fantasy.

"Our plan was to get our foot in the door at each location starting with accounting functions and then later add things like the tool crib and shipping and receiving," he explains. PCs would be the shock troops, and the AS/400 would provide the raw processing power. But, Peruchini notes, critical systems in some of the plants operating on Intel Corp. 8088 PCs started to break down under the pressures of growth.

While they waited for someone to come in and fix the machines, the accounting and purchasing functions could be out of commission for as long as two days, Peruchini says. What's more, the pace of business expansion, averaging about 15% a year, kept his people busy with the 4300. Faced with the choice of either hiring more people to maintain legacy systems or moving implementation plans forward more rapidly, Peruchini chose the latter.

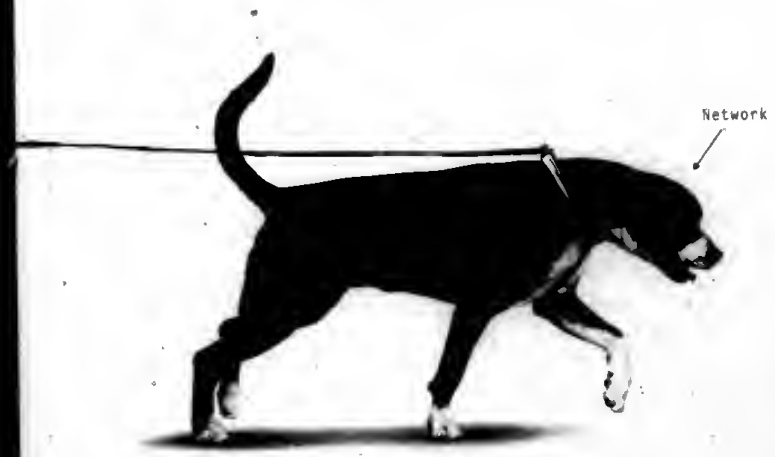
By the end of 1993, Peruchini says, the transition to the AS/400 was complete, and the 4300 had been unplugged.

Continued on page 16

Superior Industries International, Inc.

1994 revenue:	$456M
1994 net income:	$56.3M
Total employees:	5,000
IS employees:	11
IS spending as % of revenue:	0.5

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Continued from page 14

Also, a first-generation electronic-mail system was running on two leased lines linking all the plants. Early this year, the leased lines were replaced by IBM's Advantis, a proprietary communications service. "That's been really good for us," Peruchini says. "It gives direct E-mail access to companies like Ford and may even tie us with the Hungarian plant."

The E-mail system supports a new document imaging system that will make "all quality and engineering documents available to everyone in the company at the same time," Peruchini says. Best of all, though, "IBM will keep us upgraded on new technology, and I won't have to hire any communications specialists."

Peruchini says the principal impact of the improvements in IS at Superior hasn't always been obvious, but all changes affect the bottom line. For instance, sales to the automobile aftermarket through retailers represent only about 10% of business and require faster response, smaller lots and other special treatment that is not as crucial in volume-oriented sales to the Big 3 auto companies. Peruchini says IS helps integrate those requirements as efficiently as possible.

Doing business electronically is no longer optional in the automobile industry, he adds. "Our customers demand EDI," he says, "and being able to trace a lot through bar coding is also increasingly standard practice."

Financial analysts agree. "Particularly with respect to process-control activities and cost information, I would say Superior is definitely a state-of-the-art company," says Josepb Phillipi, senior vice president at Lehman Brothers, Inc. in New York.

"Superior has always had a good sense of what is going on out on the shop floor," Phillipi says, "but nowadays companies need daily, moment-to-moment access to information." That's particularly true, he adds, in the automobile industry, where the Big 3 "are always looking for additional price givebacks."

Looking back on six years of change, Peruchini says of his 11-person IS organization: "We definitely believe we are doing a lot with a little, and we are proud of it."•

Earls is a freelance writer based in Franklin, Mass.

THE TOP FIVE

The Rest

AES Corp.

ARLINGTON, VA.

Number 2

TO SAY THAT INFORMATION systems activities are decentralized at AES Corp. is something of an understatement. In fact, the company devotes just two full-time employees to IS; all others are asked to manage and police their own systems.

One of the largest independent power producers in the world, AES designs, builds, owns and operates electric power plants and sells electric power to utilities. Currently, it operates six plants in the U.S. and three abroad. Another five plants outside the U.S. are under construction.

Andrea Stanley-Miller and Brett Galura are AES's IS representatives. If pressed for traditional titles, they reluctantly offer director of computer services and LAN administrator, respectively. But they prefer being called computer consultants, which is



ANDREA STANLEY-MILLER, director of computer services at AES IS functions like a consultant for internal customers at the power company giant

Photograph by Katherine Lambert

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   - 23. Dir./Mgr. Sys. Development, Systems Architecture
   - 31. Programming Management, Software Developers
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
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(c) OS/2 (g) Windows
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App. Development Products
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❑ Yes ❑ No

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of the Best

BY KATHLEEN COW

AES Corp.	
1994 revenue:	$533M
1994 net income:	$100M
Total employees:	680
IS employees:	2
IS spending as % of revenue:	0.1

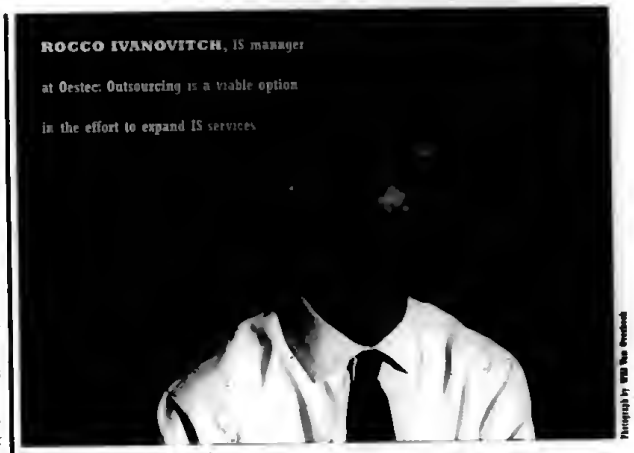
more descriptive of what they do.

For instance, they consult with people such as Maureen Shearer, who has been an administrative assistant at AES headquarters for six years. Shearer recently researched an electronic-mail package for AES. After consulting with Stanley-Miller, she purchased Microsoft Corp.'s Mail and became the mail administrator.

Stan Brayton, one of four electrical technicians at AES's Thames Power Plant in Uncasville, Conn., also made use of the IS consulting model. Brayton says when it comes to IS, the plant's employees have become "like a self-help group."

Five years ago Brayton became the de facto IS representative at the Thames plant when he volunteered to learn about the Digital Equipment Corp. MicroVAX and fill the spot vacated by the plant's previous IS support person. He largely taught himself through seminars and by using Stanley-Miller as a resource and consultant. Brayton still fixes the plant's motors and switchboards, but now he also counsels users on PC buys, recovers lost files and does systems maintenance and backups for the MicroVAX.

What's going on at this company? "The plants and the people are empowered to buy the equipment they need to do their jobs," Stanley-Miller says. "If they see an opportunity, they can go after it." AES's IS independence is an offshoot of its corporate philosophy, which gives employees the power to make decisions for themselves. In return, the company expects its employees to be responsible for the systems they use •



ROCCO IVANOVITCH, IS manager at Destec: Outsourcing is a viable option in the effort to expand IS services

Photograph by Bob Durbin

Destec Energy, Inc.

HOUSTON

Number 3

AS GROWTH IN THE independent power industry moves from the domestic market to international markets, many companies are revamping their organizations to better support international business development. Among them is Destec Energy, Inc., formed as a spin-off from Dow Chemical Co. and one of the largest independent producers of power in the U.S.

Similar to AES Corp., which is ranked second in the *Premier 100*, Destec develops and owns power projects and produces and sells electricity. It also sells thermal energy and synthetic fuels. Currently, Destec has an interest in 19 operating power projects and has three projects under construction, all domestic. By 1997, the company expects to have two foreign plants in operation: one in Canada and another one in the Netherlands.

Last fall, the company began restructuring as part of its goal to shift from a domestic to an international focus. The restructuring plan included outsourcing most engineering systems, the subsequent layoff of nearly 200 engineers and a merger between the engineering IS group and the corporate IS organization.

Rocco Ivanovich, former head of the engineering IS group, was tagged to man-

Continued on page 18

Continued from page 17

age the merged IS entity of 12 staffers, down from 22. He has been charged with refocusing IS services and making inroads to provide service in areas IS does not now serve.

Projects will continue to be outsourced, Ivanovich says, "if we don't have the expertise or the resources [in-house]." For example, he is considering outsourcing an application to handle international leads.

However, if the expertise is available in-house, "IS is now willing to design specific apps to meet our needs," says Leslie Woods, a contract financial analyst in Destec's business management group. "If anything, the restructuring has helped put people where their skills are, so resources are better allocated," she says.

IS recently designed a specialized database for the business management group to help analysts build long-term models for plants. This will allow the analysts to forecast expected production data and operating expenses, for example, for a particular plant over a number of years. IS developed the application using PowerBuilder and Excel.

Destec Energy, Inc.
1994 revenue: $727M
1994 Net income: $110M
Total employees: 703
IS employees: 12
IS spending as % of revenue: 0.5

With the increase in outsourcing, Destec's relationships with its suppliers and partners will become even more critical. Fostering an atmosphere of partnership, one that clearly identifies shared rewards and risks, is something the company takes seriously, according to Petet Batura, Destec's account manager at Houston Legal Copies, Inc., a solutions integrator that specializes in documentation.

"That atmosphere, combined with IS's sharp focus on its goals," Batura says, "is what creates an environment prone to success."

Partnerships, it seems, are in everyone's best interest. ●



DONALD L. CERULLO, VP of corporate IS at smokeless tobacco firm UST: "We wait 'til a technology is tried and true before we adopt it."

Photograph by Kitty Bean

UST, Inc.

GREENWICH, CONN.

Number 4

AS THE RUNAWAY LEADER IN the world of smokeless tobacco — controlling 85% of the market, according to one Wall Street analyst — UST, Inc. is not so much motivated by its competitors as by its customers, who are driving the company's move toward increased operating efficiencies.

UST is a holding company for four wholly owned subsidiaries: United States Tobacco Co., International Wine & Spirits Ltd., UST Enterprises, Inc. and UST International, Inc. In 1994, the company's Copenhagen and Skoal brands of smokeless tobacco accounted for 87% of revenue. The remainder of UST's revenue came from pipe tobacco, pipe and pipe cleaners and Chateau Ste. Michelle wines.

"As customers become more demanding, it forces us to become more effective and more efficient," says Donald L. Cerullo, vice president of corporate information systems. For instance, customers used to be satisfied with a one-week turnaround time from placement of an order to shipment by UST. Now, he says, the customers are demanding faster delivery.

Two of UST's recent IS initiatives that respond to customers' demands for increased efficiency are STARS, a mainframe-based Sales Tracking and Reporting System, and LITARS, a server-based Logistics Information Tracking and Reporting System.

STARS provides sales and marketing staff with desktop access to three years of data on products and customers. LITARS helps logistics staff monitor and improve order delivery by tracking outbound shipments to customers and reporting delivery exceptions. Built using PowerBuilder and Microsoft Corp.'s SQL Server, LITARS is the company's



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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products
❑ Yes ❑ No

Networking Products
❑ Yes ❑ No

E4PKS-5

UST, Inc.	
1994 revenue:	$1.2B
1994 net income:	$381M
Total employees:	2,000
IS employees:	55
IS spending as % of revenue:	1.2

first client/server application, according to Cerullo.

To guide the company on where and how it spends its IS budget, Cerullo has a three-point plan for moving the IS department and the company in a steady, controlled fashion toward new technologies, including client/server.

The first and most broad-based factor in this plan is UST's strategic planning committee, which acts as the filter for corporate decisions about new technologies. Cerullo has been a member of this committee for the past two years.

"It ensures that IS is focused only on those projects that are strategic to the company," he says.

The second factor is a rule that Cerullo lives by: UST does not chase leading-edge technologies. "We wait until a technology is tried and true before we adopt it," Cerullo says.

STRATEGIC OUTSOURCING

The company's outsourcing strategy goes hand-in-hand with its efforts to minimize its exposure to untried technologies. UST outsources only those things, "that we believe are not strategic to us," Cerullo says.

The company outsources some programming and PC maintenance but keeps tight reins on mainframe operations.

UST's third rule is that it has standardized on Intel Corp. 486 or higher Microsoft Windows-based networked PCs. Information technology also supports only a limited set of office productivity applications, including word processor, spreadsheet and presentation packages.

The effect of standardization, Cerullo boasts, "is that IS can support more than 700 users with a help desk of four people and a network support group of four."

That's one IS staffer for every 87.5 employees. •

Carnival Corp.

MIAMI

Number 5

THERE ARE PLENTY of islands to be found in Carnival Corp.'s present and future, but none of them will be islands of information. At least not if Jim Bussey, information systems vice president at Carnival Cruise Lines (CCL), has his way.

As the largest cruise line operator in the world and parent of CCL, Holland America Line and Windstar Cruises, Carnival Corp. must provide some 26,000 passengers on 22 ships with all the amenities of a stationary resort hotel. Bussey's job is to support both corporate headquarters and the 10 ships in CCL's fleet.

His top three priorities are interoperability, flexibility and listening to users.

Carnival Corp.	
1994 revenue:	$1.8B
1994 net income:	$381M
Total employees:	15,000
IS employees:	114
IS spending as % of revenue:	1.0

Interoperability is critical for CCL's disparate systems to talk to one another — from the Sun Microsystems, Inc. SPARCstations running the shipboard applications to the linchpin reservation system that sits shoreside on a Unisys Corp. 2200 mainframe. Any potential device or application that doesn't communicate with standard protocols is rejected, Bussey says.

Passenger credit-card approval and remittance processing are tied into the homegrown reservation system which, in turn, is integrated with the marketing system. The company's reservations and sales agents use both systems for sending 7,000 to 50,000 faxes a day to travel partners with the latest information about itineraries, ships and shore excursions.

Bussey's flexibility and listening skills came in handy when a financial technology group, formed to liaise with IS, asked for a role in computer design. Immediately, red flags went up for Bussey, who was schooled in the old ways of the glass house.

Still, Bussey decided to give the finance technology group what it wanted. As a result, the IS department is now getting into an imaging project that is being driven by that group, Bussey says.

The outcome: His department's most recent initiative is a successful imaging project, driven by none other than the financial end-user unit. •



Photograph by Rod Dugan

Information

MANY OF THIS YEAR'S PREMIER 100 COMPANIES RAVE SALES UNDER $1 BILLION *AND* THEY'RE GOOD AT MANAGING IT. IS THERE A CONNECTION?

BY BRIAN McWILLIAMS

AT A RECENT MEETING of the American Forestry and Paper Association's information systems roundtable, Donald Newsom listened intently as IS executives from industry giants such as International Paper Co., Georgia-Pacific Corp. and Weyerhaeuser Co. recounted struggles against corporate bureaucracy.

The irony was not lost on Newsom, MIS director at Caraustar Industries, Inc., an Austell, Ga.-based paperboard manufacturer. Caraustar had sales of $456 million in 1994 and has 3040 employees.

"Some of these people had over 600 employees in their IS group alone," Newsom says. "When I told them we were doing the same thing with only 20 people, they all said, 'Keep that quiet!'"

Well, the secret is out. Despite their lean IS staffs and skimpy overall information technology spending, small to medium-sized companies such as Caraustar, No. 34 on this year's *Premier 100*, have been creating shareholder value like crazy. As a result, these firms, with revenue ranging from $100 million to $750 million, dominate this year's ranking. In fact, only four *Fortune* 100 companies made it onto the *Premier 100* list. (See "MIS-Fortune" on page 23.)

While it's tempting to blame the poor showing of large corporations on bloated IS departments and poor IT management, that would be simplistic, says Paul Strassmann, creator of the Information Productivity Index (IPI), which is the formula *Computerworld* uses to rank the *Premier 100*. (For an explanation of the IPI, see page 10.)

"Information productivity is a function of much more than technology," Strassmann says. "It's a measure of how effectively a company's information sector — people in sales, administration and research and development — contributes to the economic value of a firm."

Some analysts, however, believe IT plays a key role in the higher productivity of smaller companies.

"Without technology, small companies couldn't have

McWilliams is a freelance writer based in Durham, N.H.



Entrepreneurs

achieved such revenue growth without a comparable growth in costs," says Sid Harris, dean of the Peter F. Drucker Management Center at Claremont Graduate School in Claremont, Calif.

That view is shared by Erik Brynjolfsson, associate professor at MIT's Sloan School of Management in Cambridge, Mass. "Smaller firms can benefit disproportionately from information technology. IT enables them to coordinate [activities] more efficiently and to outsource nonstrategic activities," says Brynjolfsson, the author of a widely publicized 1993 study linking IT investments to prodoctivity at *Fortune* 500 companies.

To be sure, there's no single path to information productivity. And only time will tell whether the high productivity scores of smaller firms are just a halo effect from their go-go growth. But a closer look at a handful of smaller firms from the *Premier 100* reveals stark differences in how they manage information vs. larger firms.

For a quick compare and contrast, take Denise Utley, systems coordinator at Tampa, Fla.-based Outback Steakhouse, Inc., ranked No. 9 in the *Premier 100*. In a previous life, Utley was a restaurant manager at Taco Bell Corp., a chain frequently heralded in the press as a technology leader.

MANAGING IT

"It was data overkill," Utley says of Irvine, Calif.-based Taco Bell. "Restaurant managers spent eight hours a day running reports. They hardly ever got out to the front of the store."

Outback Steakhouse, on the other hand, didn't even have computers in its 260 restaurants until 1992, according to Utley. That's when the company worked with a local consultant to create a restaurant management system that tracks labor, sales and inventoty information and produces a variety of basic summary reports. It's a far cry from the technology at Taco Bell, she says. "We don't do much forecasting or theorizing. We want to avoid over-analyzing our business."

What's to analyze when your profits are doubling each year, as they have at Outback since it opened in 1987? To ensure that its restaurant managers spend most of their time serving customers, the dinner-only chain, which sports an Australian theme, has designed its reporting systems to be simple and streamlined.

Continued on page **24**



RISING ABOVE THE BUREAUCRACY: Donald Benson, MIS director for paperboard maker Caraustar Industries, Inc., outperforms larger competitors with an IS staff of just 20 people.

Photograph by Rob Nelson, Illustration by Larry Goode

Total multi-vendor chaos incompatible protocols inflexible systems inaccessible

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SSFAM 1

Continued from page 21

"We don't want our restaurant managers drowning in greenbar printouts. If the information isn't meaningful to them, we won't collect it," says Bob Merritt, vice president of finance. "This is still a people business," he adds, "and I don't think you can judge the quality of operations from financial reports."

Coming from a chief financial officer, those words verge on heresy, but Outback isn't afraid to challenge conventional wisdom. Case in point: The restaurateur doesn't use data to micromanage the stores from headquarters. "We don't want computers telling our restaurant managers how to run their businesses," Merritt says.

AVOIDING BUREAUCRACY

You won't find much IS bureaucracy at Amarillo, Texas-based Western National Corp. either. Ranked No. 15 in the *Premier 100*, Western National is a leader in the annuity business, managing assets in excess of $8.6 billion with a data processing staff of 11 people.

Like Outback Steakhouse, Western National has no executive in charge of information systems. The rationale: "We don't want to bottleneck [information management] through one person or one department, such that if you want information, you have to go to them," says Darryl Allen, second vice president of annuity operations at the insurer, which had 1994 revenue of $615 million. (Western National was formed in February 1994, as a spin-off from Conseco, Inc.)

The strategy seems to be working. A recent investment report by Stanley Goldring, director of research at Ladenburg, Thalmann and Co. in New York, singles out Western National for its efficiency compared with the rest of the life insurance industry, which, according to the report, "languishes under entrenched bureaucracy and outmoded processing systems."

As Allen sees it, the key to information productivity isn't having lots of information at your fingertips, it's having fewer decision-makers. Three changes in corporate ownership in the past 15 years have prevented a bureaucratic morass at Western National.

"When you only have 200 employees, you sort through issues pretty quickly," Allen says. "We get information, make a decision and go on with it. We're not fighting about it a year later."

The company's current systems efforts are aimed at better supporting front-line representatives. "We have to do a better job at pushing information down to the people who can do something with it," says Allen, who is leading an initiative to re-engineer the company's business processing systems.

Making customer service the basis of competitive advantage is hardly unique. Those who succeed usually have figured out how to tie information management to customer support.

"One way to keep customers coming back is by giving them the information they need to run their own businesses smoothly," says Jack Pacey, director of information services at Wausau Paper Mills Co., ranked 25 on the *Premier 100*.

Though today's sky-high pulp prices may tempt another company into a strictly cost-driven focus, Brokaw, Wis.-based Wausau, which sold over $426 million worth of writing, printing and specialty papers last year, remains customer driven, Pacey says.

Wausau's "check stock" program, for example, lets customers dial in for recorded real-time information on inventories before placing an order. When customers want to speak to a live person, service department representatives can pull up detailed order information, such as shipping dates. The reps can bump "hot" items to the top of the list if a customer is in a crunch. Orders are then transmitted electronically to warehouse workers via radio frequency units mounted on their forklifts. And, as an order leaves Wausau's docks, the on-line inventory system automatically faxes a detailed shipping notification to the customer.

Remarkably, Wausau gets all this done while spending less than 1% of sales on IT, according to Steven Schmidt, vice president of finance. There's no magic involved. "We manage IS the same way we do the rest of the company: We focus resources on areas that matter," he says.

IN THE BUSINESS

Responsiveness to internal customers is another big factor differentiating IS groups in small companies from their larger brethren. Too often in big companies, end users and IS become locked in what seems like a game of *Mortal Kombat*, one of the hot-selling arcade games manufactured by WMS Industries, Inc., WMS ranks 42 in the 1995 *Premier 100*.

But talk to end users such as Sue Knauer, a materials manager at Chicago-based WMS and you'll hear unsolicited praise for IS: "Our systems people are extremely easy to work with. It's not like some companies, where you just submit a form to them and wait for a response."

That's because WMS colocates most of

Illustration by Larry Goode



MIS-Fortune

ONCE A SIGN of corporate achievement, making the *Fortune* 500 has become a dubious distinction. After all, ranking companies by revenue alone says little about the performance of their businesses.

Only 19 *Fortune* 500 companies made it onto *Computerworld*'s 1995 *Premier 100* list, and only four of those are *Fortune* 100 companies: Coca Cola Co., ranked 48 on *Fortune*'s list and 61 on the *Premier 100*; Merck & Co., 59 on *Fortune*'s and 50 on the *Premier 100*, Anheuser-Busch Cos., ranked 85 and 94, respectively; and Bristol-Myers Squibb Co., 86 and 78, respectively.

The poor showing of the top *Fortune* firms begs the question: Is size relevant?

Sure, the *Fortune* 100 account for 63% of the nation's gross domestic product. But size captures past success. The collective ability of these companies to manage information — as measured by *Computerworld*'s Information Productivity Index (IPI) — may be a more appropriate indicator of their future competitiveness. (See page 10 for an explanation of how the IPI is calculated.)

Hurting the IPI scores of big companies such as General Motors Corp. is the bureaucracy in their information sector, as indicated by plump selling, general and administrative (SG&A) and R&D expenditures.

On average, the three-year IPI of the *Fortune* 100 averaged 0.12, about one quarter of the *Premier 100*'s overall 0.43. average.

Of course, no measure of corporate performance is perfect. Bur as the economy shifts in favor of smaller, less vertically integrated companies working in interconnected supplier relationships, information productivity may be the number to watch.

— Brian McWilliams

Big ⊗ Productive

3-Year Information Productivity Index for the Top 10 Fortune 500 companies

1.	General Motors Corp.	**-0.57**
2.	Ford Motor Co.	**-0.23**
3.	Exxon Corp.	**0.03**
4.	Wal-Marr Stores, Inc.	**0.10**
5.	AT&T	**-0.07**
6.	General Electric Co.	**0.15**
7.	IBM	**-0.23**
8.	Mobil Oil Co.	**-0.23**
9.	Sears Roebuck & Co.	**-0.03**
10.	Philip Morris Cos.	**-0.10**

Source: *Computerworld* and Paul A. Strassmann

its 18-person IS staff at the company's business units. They work shoulder to shoulder with users such as the crew of young, creative engineers who design WMS's pinball and video games. The IS staff is developing a document management system for this design team.

The arrangement gives Theresa Pudi, director of MIS ar WMS, great flexibility in assigning resources. "In big companies, everything is done through committees, and decisions can take forever. Here, I can easily borrow a programmer from one group and give him to another," Pudi says.

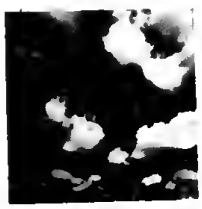
Pudi says all IS executives talk about the need for aligning IS with the business, "but we get to do what others only preach. Our group knows everyone in the company because we are literally in the business."

Similarly, Newsom says he still tries to find time to walk around the plant and chew the fat with people. He also personally tests all the major new applications developed by his group before releasing them to users. "Word gets around pretty quickly that you're here to help, so we're viewed very well by users," Newsom says.

Of course, IS managers in smaller companies sometimes have to set some limits on responsiveness. Newsom says he and his staff all carry pagers and are on 24-hour call. But as he gets older, it's becoming harder to respond to 3 a.m. calls from panicked users who can't get their PCs to boot. Maybe some lessons in delegating big-company style are in order. **100**



IN THE BUSINESS MIX: Theresa Pudi, MIS director at WMS Industries, maker of Mortal Kombat, colocates her 18 IS staffers in the company's business units.



Network Management - UK



Internet Services - USA



Wireless Data Collection - Brazil



CTI Solutions - Japan



Real-Time Billing - China



Interactive Services - France

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CLIENT/SERVER

No Pain,



No Gain

While **86%** of *Premier 100* companies surveyed are using client/server, many maintain a healthy skepticism

BY WILLIE SCHATZ

THE GOOD SEEMS TO OUTWEIGH THE BAD for most *Premier 100* companies grappling with client/server implementation.

Take The Charles Schwab Corp., the world's largest discount broker and No. 68 on the *Premier 100* list. Schwab's 510-person IS staff is in the middle of a seven-year initiative to remake its information systems with client/server.

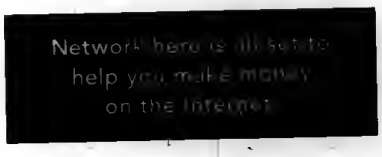
"Moving to client/server has tremendously increased our internal productivity," says Dawn Lepore, Schwab's chief information officer. "We're replacing our old [MVS-based mainframe] because it no longer had the capacity to handle our increasing business demands. We're integrating our telephony applications. We're giving our users a [graphical user interface] with Windows. That's putting more information at our users' fingertips."

These wholesale changes enable Schwab to provide better service to its customers, Lepore says. "We can respond to their requests faster and more accurately. And we

Continued on page **30**

Illustration by Jon Pumilay

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Continued from page 21

can get their requests to market before any of our competitors."

Schwab fits the client/server *Premier 100* profile to a tee. Most of the 56 *Premier 100* companies that responded to *Computerworld*'s survey say they are implementing client/server for competitive advantage. Specifically, they want to increase the flexibility and autonomy of users, improve business performance and decrease information technology development cycle time.

Of course, there's no gain without some pain. The biggest problem *Premier 100* companies face in their client/server implementations is the complexity of the multivendor environment (57%) and the lack of trained personnel (55%), according to the survey.

"If you implement client/server just to save money, you're going to be in deep [expletive]," says W. Ben Kuenemann, senior managing director at The Bear Stearns Cos., the New York financial services holding company and No. 33 on the *Premier 100*.

Kuenemann led Bear Sterns into the client/server world to attack the cycle time between the start and the finish of a financial transaction; in the money game, an extra nanosecond can mean extra millions of dollars. Kuenemann's first experiment was to transfer the government trading piece of the business from an Amdahl Corp. 700 mainframe transaction-based system to a Unix-based client/server environment running on a Sun Microsystems, Inc. SPARC 2000.

"We've had limited success, but at least it works," Kuenemann admits.

People are a key factor in the success of client/server, he says. "Client/server is a relatively new technology, so not as many people understand it or know how to design for it," he says. "Getting and keeping well-trained staff is very difficult."



Photograph by Brian Smale

> "If you implement client/server just to save money, you're going to be in deep [expletive]."
>
> **W. Ben Kuenemann**
> Senior managing director, The Bear Stearns Cos.

TEAMWORK

When the right team does come together, everyone knows it. Just ask Omaha, Neb.-based First Data Corp., ranked 46 on the *Premier 100*.

The world's largest provider of bank-card processing and other high-volume information services was desperately seeking an imaging system that would be more efficient, more effective and faster at reading credit-card applications.

"We wanted a system that would handle 10,000 image applications a day," says Jim Brown, senior vice president of First Data's bank-card program services. The system had to accurately read handwritten credit-card applications.

Brown assembled a specialized, experienced team of IS staffers to work only on this intelligent character-recognition application. The team developed a client/server solution that recognizes 60% to 70% of the characters it sees and makes educated guesses on the remaining ones. The system, which will go on-line later this year, is based on an in-house version of a Wang Laboratories, Inc. imaging system running on Hewlett-Packard Co. servers. Desktop users tap into the database via Pentium-based PCs.

"There's been a 300% improvement in the number of applications handled by our employees," Brown says. "Bank customers can get their loans much faster. It's made us much more efficient. It also makes us much more marketable to other clients."

COMPETITIVE ADVANTAGE

Pain or not, client/server is seen as a competitive necessity for many *Premier 100* companies. "If we determine that a new technology will give us a competitive advantage and that the return on investment is worth the risk, we'll be first," says Steve Sullivan, manager of the data center at Baltimore-based T. Rowe Price Associates, Inc., ranked 55 on

Why implement client/server?

• Increase end-user autonomy	61%
• Decrease IT development cycle time	39%
• Improve business performance	36%
• Improve IT customer satisfaction	36%

Source: *Computerworld* survey of *Premier 100* companies

the *Premier 100* Sullivan sees client/server as a tool for boosting productivity. "We look at everything we need to do and where client/server systems will run best." T. Rowe Price spends about $15 million annually on client/server, he says.

One current client/server project is an imaging system for customer service representatives. When a customer calls, the database recognizes the caller's number and transmits all the necessary information (discounted brokerage accounts and mutual funds, for instance) to the representative on the line, says Tim Hudner, vice president of enterprise initiatives. The system can read the number a customer dialed and tell the representative what specific information the customer is requesting. For example, the rep will know if a customer dials a toll-free 800 number in response to an Asia-fund ad.

"In general, we're successful," Sullivan says, while ruing the additional six months it took to develop the imaging system. "That's not inconsistent with our client/server experience generally. Client/server systems cost just as much to develop and more to maintain than most mainframes, but client/server gives you much more functionality and flexibility." Still, Sullivan is in no rush to dump the mainframe.

Any *Premier 100* company will tell you client/server delivers the goods, even if few have plans to discard the mainframe. In some cases, the gains are a matter of survival.

"To not do client/server because you think it's too expensive or that it's too difficult to find experienced people or that they're going to cost too much is not an acceptable answer," Kuenemann says. "You've got to have an architecture that's nimble enough to meet your customers' requirements faster than your competitor can." **100**

Carol Schatz is a freelance writer based in Washington, D.C.

What has been the most difficult aspect of implementing your client/server system?

"The hardest thing has been for someone to give us a definition of what exactly client/server is. If it came in a box, we'd be all set."
Rick Madola
Director of MIS, Audiovox Corp

"The way we announced it and the uproar it caused in the technological community. We just said that the client/server system would eventually replace the mainframe. That caused a terrific culture clash between the mainframe bigots and the distributed computing visionaries."
Jim Brown
Senior vice president of bank-card program services, First Data Corp

"Making such classic mistakes as picking applications that weren't appropriate to the technology and picking tools which vendors said were robust — then discovering that they weren't."
Peter Crowell
Vice president of MIS, CBS, Inc.

"Finding tools to manage the system day-to-day. There are no capacity planning tools on the market, and there are no tools for managing the environment from a central location. And even now it's difficult to find people who know what they're doing in client/server environments."
Steve Sullivan
Manager, data center, T. Rowe Price Associates, Inc.

"Multiple vendors. They're a part of life, but they're still very difficult. Immature products and a very painful internal learning curve. [Client/server] is sold as being much easier than it really is."
Dawn Lepore
CIO, The Charles Schwab Corp.

"Standardization. You don't do it the same way in each and every instance."
Nicholas M. Elsenbe
Vice president of information services, Arthur J. Gallagher & Co.

"The middleware matrix jail. The tools that we've been using don't mate together. The front-end tools, back-end database engines and third party cause an extreme frustration."
Ronald Boeving
Vice president of IS, HealthCare Compare Corp.

RE-ENGINEERING

Approaches differ widely, but business process re-engineering has earned a place in **93%** of these leading firms' corporate toolboxes

Revamp Champs

BY JOSEPH MAGLITTA

IT'S BECOME FASHIONABLE in many information systems circles to scoff at re-engineering. "A fad," sniff some. "New name, old stuff," huff others. But you're unlikely to hear such talk from *Premier 100* companies.

Most say they are tackling major process redesigns, especially in finance and accounting, customer service and order fulfillment (see chart page 34). So much for the notion that only struggling organizations need to re-engineer.

You're also unlikely to see *Premier 100* companies using a cookbook approach to process redesign. While all of them have a methodology, they've adapted re-engineering to fit their own business and culture. Here's a look at the strategies of three *Premier 100* companies: Eli Lilly & Co., ranked 97, Royal Carribean Cruises Ltd., ranked 92, and Amgen, Inc., ranked 40. At Eli Lilly, new Chief Information Officer Tom Trainer recom-

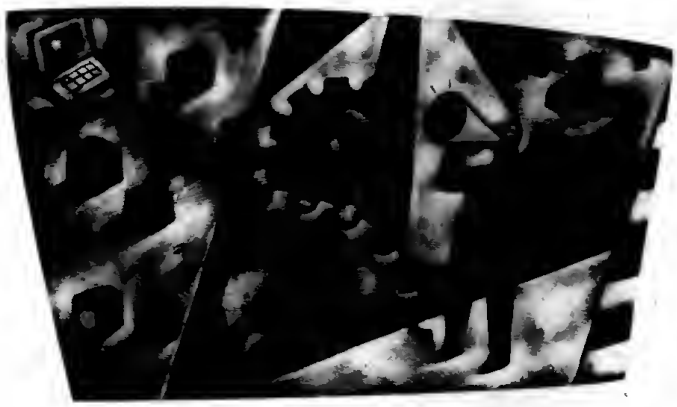


Illustration by Joe Fleming

mends re-engineering as powerful medicine.

Since taking the CIO job in March, Trainer has stepped up Lilly's 2-year-old effort to recreate drug development, manufacturing, order processing and distribution. In an industry feverish about speed, economy and efficiency, Lilly burns with the best of them.

SIG SAVINGS

The company says process revamps have moved it toward a goal of slashing 25% from sales and manufacturing costs. Total projected savings from re-engineering is $200 million. The firm's Sphinx Pharmaceuticals Corp. in Durham, N.C., has increased the speed of discovering new drug compounds by 2000% over the last couple of years by using virtual reality and Cray Research, Inc. supercomputers.

"The paradigm has shifted enormously in the drug industry," says Larry Rothman, who heads Ernst & Young's pharmaceutical industry practice. "Speed to market is key."

Trainer is helping to take re-engineering outside company walls in hopes of turning the world's 11th largest drug maker into a value-added provider of pharmaceutical and treatment information, products and services.

To get ahead technologically, Lilly Chief Executive Officer Randall Tobias hired Trainer from Reebok International, Inc. At Reebok, the 24-year industry veteran led a four-year, $75 million redesign effort.

In his new post, Trainer has a seat on the influential 10-person board that runs Lilly. He also plays a lead role in inventing new business directions and in the company's re-engineering program.

For the first time in many years, the $5.7 billion Indianapolis-based firm also revised its mission statement to emphasize information technology. It is this high-level commitment, Trainer says, that drives company re-engineering efforts.

As described by Lilly, the new wave of re-engineering will reach into the offices of physicians, pharmacists, clinics, insurance companies and even testing labs via the Lilly Health Care Network.

> "Re-engineering is crucial to the survival of Lilly."
>
> **TOM TRAINER**
> Chief information officer at Eli Lilly & Co.

This national network would deliver a wide range of information and value-added services to various parts of the healthcare chain. Doctors, for example, could get real-time advice on the best, most cost-effective drug treatement program.

Trainer and his 900-member staff will play a key role as the burgeoning network further evolves. "Re-engineering," he declares, "is crucial to the future survival of Lilly."

ON THE HIGH SEAS

At Royal Carribean Cruises, vacationers to Aruba, Jamaica, Mexico and other exotic spots aren't the only people sailing the high seas.

Each cruise by the Miami-based line takes hundreds of crew members working in food service, hospitality, the casino and even in IS. Deploying several thousand workers serving on 10 ships that make hundreds of cruises a year is no small task.

"Senior management recognized that we were spending a great deal of resources on people, time and money to acquire crew and move them around from ship to ship," says Ronald W. Sieman, vice president of information technology. Airline, hotel and interviewing costs totaled millions of dollars annually.



Photograph by Ronald Kibler

And the big job promises to get bigger: Royal Carribean plans to add five new superships by early 1998.

Convinced that hiring and crew tracking costs had to be reduced, the 25-year-old cruise line decided earlier this year that crew acquisition and management would make an ideal first redesign project. "We haven't had massive re-engineering around here," says Sieman, who heads a 90-person IS group. "We chose carefully."

As part of the solution, this summer Carribean began an 18-month in-house project to develop an AS/400-based client/servet system that will track travel costs for employees, forecast crew movement on and off ships and ensure that company employees get the best airline deals.

Formed in the spring, a seven-member steering committee includes senior managers from finance, food

Continued on page 34

Q. What's your worst re-engineering nightmare?

"Unrealistic upper management expectations of what was going to come out. Cost savings and timing were unrealistic. We had to put it all in perspective. We're not going to save a million dollars in a year, but maybe more like $500,000 in five years."
RICK MADDIX
Director of MIS, Audiovox Corp

"Some of our problem areas have been where the users more or less are not prone to go paperless. [In some sites] we've tried to take the paper away and couldn't do it. It causes problems because of timing. [On-line] is real time. Paper isn't."
JOHN E. PACEY
Director of information services, Wausau Paper Mills Co

"I can't say we've had any nightmares. We have so many opportunities in re-engineering, I'd [say] the only thing we need to do really is prioritize ... what we think is going to give us the biggest bang for the buck. But I wouldn't call that a nightmare."
RICH CRUTCHFIELD
Senior vice president of technology and database services, Equifax, Inc.

"Too many variables can be a nightmare. The re-engineering process, the technology and the people workflow. Anytime you try to change the variables, you lose."
ALLAN DITCHFIELD
Director of MIS, The Progressive Corp

"The biggest re-engineering problem is a lack of commitment from the top. If that's not there, the effort will fail."
TOM TRAINER
CIO, Eli Lilly & Co.

RE-ENGINEERING

Continued from page 33

and beverages, hotel, human resources, Sieman and consultants from KMPG Peat Marwick. Meeting two or three times a week, they redesigned how crews were acquired in six months.

This month, the $1.1 billion cruise line also plans to roll out a client/server-based version of CruiseMatch 2000, the industry's first direct-access booking system.

WHEN THINGS EXPLODE

Does a biotech firm that built new systems and processes from scratch only six years ago need re-engineering? You bet, says Bruce Whetstone, the former director of corporate IS at Amgen, Inc. (In July, Whetstone left Amgen after more than five years to become CIO of a large semiconductor test equipment company.)

The Thousand Oaks, Calif., firm shipped its first product in 1989 — a red blood cell booster called Epogen. In 1991, Amgen introduced a second product that boosts white blood cells. Sales shot from $200 million six years ago to $1.5 billion last year. "Things literally exploded," Whetstone says.

Amgen's systems also mushroomed. They grew from a handful of workstations and a Prime Computer, Inc. 2450 minicomputer to a worldwide network with nearly 6,000 Macintoshes, PCs, workstations and servers and a Convex Computer Corp. supercomputer.

"We invented processes as we went along," he adds.

With seven new "product candidates" in the pipeline, Amgen began rethinking core systems and processes.

Last year the firm began revamping the procurement process in hopes of eliminating paper. Researchers placed orders for test tubes and other lab supplies in a Notes database, then submitted them through corporate systems to any of a dozen or so vendors via electronic data interchange.

But when the 80-user pilot ended this summer, labor savings were 25%, only half the target. Whetstone says an investigation revealed users were slowed by a less-than-friendly interface.

Undaunted, Amgen now is looking for ways to speed up new product testing. The company recently hired Richard Chadwick as associate director of clinical information to help tackle the time-to-market issue. The firm is exploring the use of personal digital assistants to expedite field data collection.

"Who's going to get the patent position first?" Whetstone asks. "It's all data processing. Anything we can do to shorten the length of the chain is critical." **100**

Mary Brandel Magliitta is *Computerworld*'s senior editor, corporate strategies.

Where the Premier 100 focus their re-engineering efforts

• Finance & accounting	57%
• Customer service	55%
• Order fulfillment	39%
• Marketing/sales, Manufacturing, Logistics	32% (TIE)
• Product and service development	21%

Source: *Computerworld* survey of 56 *Premier 100* companies.

OUTSOURCING



In all, **73%** of *Premier 100* companies surveyed say they outsource some IT function. Which begs the question,

Make or Buy?

BY STEVE ALEXANDER

THE ILLINOIS CENTRAL RAILROAD moves 1 million freight cars a year without keeping track of any of them.

Instead, the company, ranked 22 in the *Premier 100*, outsources what is arguably its most important function, railcar management, to the information systems arm of another railroad, the Union Pacific.

Is something off the tracks here? Not at all, insists Norm Schwarz, Chicago-based director of technical network support for Illinois Central Corp., the holding company for the Illinois Central Railroad. Through outsourcing, the railroad takes care of its customers without making a sizable investment in new applications and equipment.

While there may be no direct correlation between a company's outsourcing strategy and its Information Productivity Index (the calculation used to rank the *Premier 100*), Illinois Central and other *Premier 100* companies say their outsourcing is directly tied to corporate vitality.

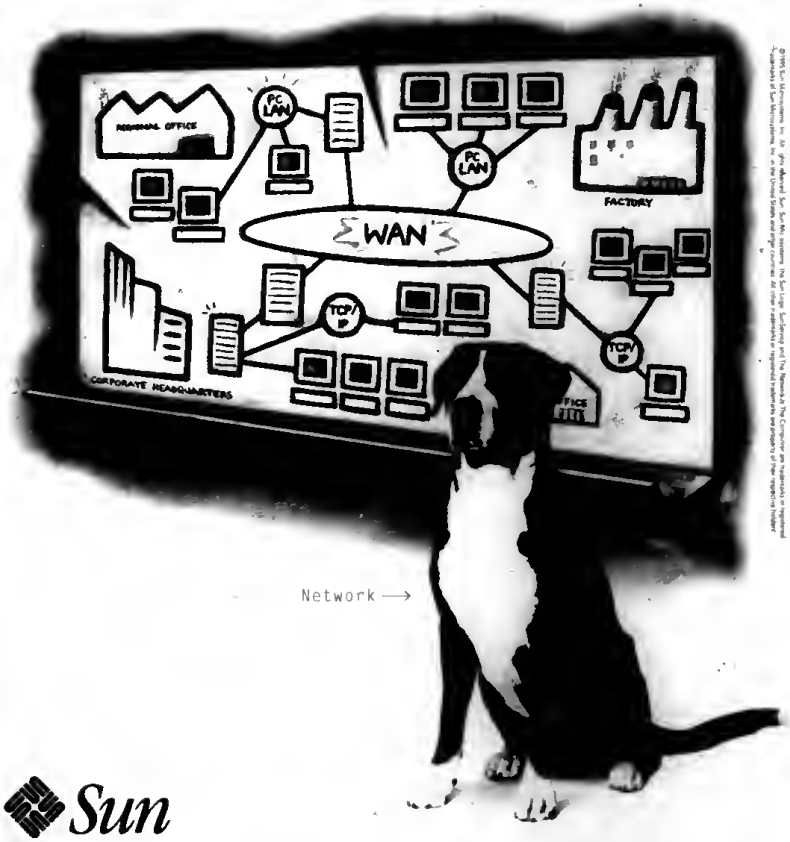
Indeed, *Premier 100* companies outsource for a variety of strategic reasons. Access to skilled professionals and the ability to focus internal resources on core applications

Continued on page 37

Illustration by Joe Pleskac

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Continued from page 35

are the two most commonly cited criteria, according to a survery of 56 *Premier 100* companies. Cutting costs and project time and increasing IS flexibility are some other reasons. Illinois Central's outsourcing decision was based on a desire to keep the size of its IS department manageable.

Illinois Central began outsourcing applications for the tracking of trains, individual freight cars and cargo in late 1990. It chose Union Pacific Technologies, a St. Louis-based division of Union Pacific Corp., the parent firm of the Union Pacific Railroad, because it knows the railway business and has a good reputation as an outsourcer for several smaller railroads, Schwarz says. (The two railroads are independent.)

Outsourcing has allowed Illinois Central to take care of its internal and external customers without adding to its 50-member IS staff. For example, Union Pacific Technologies provides electronic data interchange that is more elaborate than Illinois Central could have managed without adding to its IS staff.



Photograph by Sandro Miller

KEEP IT SIMPLE

Like Illinois Central, Champion Enterprises, Inc., ranked 85 in the *Premier 100*, chose outsourcing as a way to keep its IS staff small. Its five-person staff supports 20 manufacturing locations.

For the past 18 months the Auburn Hills, Mich., mobile home manufacturer has outsourced almost all its programming to Kirtland Associates, Inc. in Royal Oak, Mich. Since March, the company has outsourced payroll to Automated Data Processing, Inc.'s Detroit office.

With 3,925 employees and sales last year of $615 million, the company has been averaging about 30% annual revenue growth for four years.

"The big problem was that we needed programming on a timely basis because we couldn't keep up with the company's growth," says David Waters, director of information services at Champion.

Waters was unable to sell management on the need to put programmers on staff. Outsourcing was the logical option.

Outsourcing, however, is no panacea. "Losing control is the biggest frustration that we have," Waters admits. "We know that we're getting programming faster than if it were [done] in-house. But there are still times when it's never fast enough."

> "We would have had to quadruple our staff to even approach some of the things that are being done by Union Pacific."
>
> **NORM SCHWARZ**
> Director of technical network support at Illinois Central

The loss of control that occurs with outsourcing doesn't draw as many complaints as it once did. "Five years ago that issue was absolutely paramount," says Allie Young, a senior analyst at market researcher Dataquest, Inc. in Westboro, Mass. "But we've found that it has gone down on the customer list of issues because they see the other advantages of outsourcing."

According to Young, the technology companies are increasingly willing to relinquish a certain amount of control to gain competitive advantages and access to skills they don't have in-house.

HAVING IT ALL

But others, such as Jeffrey Zonenshine, MIS director at comic book powerhouse Marvel Entertainment Group, Inc. in New York, say they can outsource large portions of IS and still maintain tight control.

Marvel, ranked 37 in the *Premier 100*, has gone from 100% IS outsourcing a year ago to 50% in the last year as Zonenshine has built an internal IS staff to cope with the company's growth. Zonenshine predicts the company will reach revenue of about $800 million this year, up from $514 million in 1994. He also expects that Marvel will continue to rely on outsourcing for about half of its IS needs.

Zonenshine divides his IS needs into

Continued on page 38

OUTSOURCING

Continued from page 37

two distinct classes. "Whenever we need generic skills, we outsource," he says. "With the internal team we concentrate on more strategic opportunities where a knowledge of the Marvel business and technical environment is critical."

Marvel's IS staff primarily works on end-user computing and departmental applications, while the outsourcer handles software hotline support.

Tim Bourgeois, an International Data Corp. analyst who follows outsourcing, says Marvel is typical of a movement toward strategic or selective outsourcing in which a company keeps its core business in-house. "Most outsourcing in the past was done to save money, but that's changing quite a bit," Bourgeois says.

This change in focus was a factor in some of McDonald's Corp.'s recent outsourcing decisions. McDonald's, ranked 89 in the Premier 100, has been outsourcing improvements to existing software for two years and software maintenance for more than five years, according to Erma Gray, director of information services.

Gray says the decision to use outsourcing was based both on a savings of 20% to 30% on software improvements and a desire to keep the in-house staff focused on new technology projects.

"Our motivation was more related to employee satisfaction. This allows the [IS staff] to grow and develop in other areas," Gray says.

"It is common, to some degree, to motivate internal staff by using an outsourcer to do routine stuff," agrees Chuck Barbour, Indiana-based vice president of Midwest operations for Computer Task Group, Inc. in Buffalo, N.Y., which handles software improvements for McDonald's.

"By outsourcing with us, McDonald's no longer has to be concerned with the constant churning of staff," he says. **100**

✎ **Alexander** is a freelance writer based in Edina, Minn.

Disaster recovery (**48%**) is the most common IT activity outsourced by *Premier 100* companies. Network operations (**29%**) and application development (**25%**) were runners-up.*

*Source: *Computerworld*'s exclusive survey of *Premier 100* companies

Q. If you could do it over, what would you change in your outsourcing contract?

"One of the things we would demand now that we didn't in the first place is that the programmers remain at our location. I think we could get faster feedback when there was a problem with a program, and we could find the right person and get it changed."

DAVID WATERS
Director of information services, Champion Enterprises, Inc.

"Put in tighter controls in terms of deliverables and schedules. I've put outsourcers on [the] same level as internal staff. We tied compensation to achieving specified objectives within specified time frames. That didn't exist before, and projects sometimes dragged out too long."

JEFFREY ZONENSEIN
MIS director, Marvel Entertainment Group, Inc.

"Some clarifications. There have been questions at times about just what outsourced work is mandated by the Association of American Railroads and what 'enhancements' mean. Mandates are free, while enhancements cost money. Those kinds of things need to be spelled out a little better in the contract."

NORM SCHWARZ
Director of technical network support, Illinois Central Corp.

"I would have somebody dedicated to managing outsourcing. I'm not dedicated to that; I have some other jobs. If you go into outsourcing thinking it's hands off and give it to some other firms to do, that's a big, big mistake. It has to be managed."

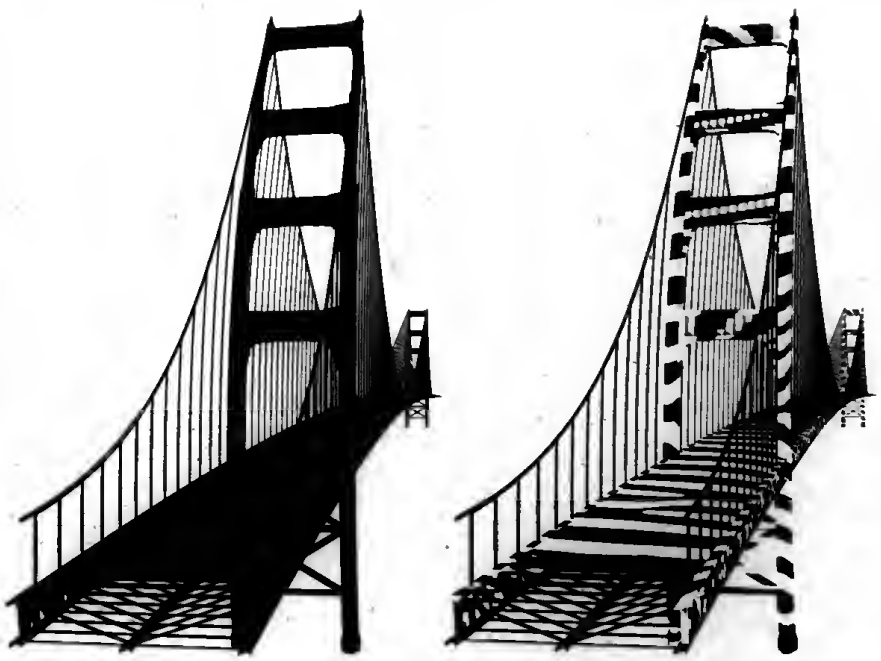
ERMA GRAY
Director of information services, McDonald's Corp.

"Being able to predict future technology, which changes so quickly. You can only forecast technology changes for a four- or five-year period. Client/server changes at 40% to 50% a year. In addition to all this newness, there's politics and changes going on."

ALLAN DITCHFIELD
Director of MIS, Progressive Corp.

"We would build in more accountability. We'd have more timelines and goals to meet and deadlines with deliverables. [In one of our projects] we did a major retail point-of-sale system which got away from us. We didn't have checkpoints along the way."

RICK MADDIA
Director of MIS, Audiovox Corp.



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Smart? Or J

TNINTY-FOUN COMPANIES ON TNIS YEAN'S PNEMIER 100 LIST SPEND LESS TNAN 1% OF THEIN REVENUE ON IS. FACED WITN TIGNT BUDGETS, TNEIN IS MANAGENS MUST KNOW TNEIR SUSINESS AND KEEP TNEIN PRIONITIES STNAIGNT..

✎ BT ROCNELLE GARNEN

FROM THE NATION'S capital to the nation's boardrooms, the focus these days is on doing more with less. But there's a fine line between being fiscally conservative and just plain cheap. Most organizations, the *Premier 100* included, seek a balance between being thrifty and miserly.

Balance is especially critical for corporate information systems departments. Lean too far in one direction and a chief information officer will fall into a budget trap that condemns the IS organization to life as a perennial cost center. Stay poised and the CIO will appease the bottom line and improve the company's competitive stance.

The secret is in knowing the corporation's business. Without that core knowledge, IS executives simply cannot balance the twin demands of lean operations and improved productivity. It's a balance that many on the *Premier 100* list appear to have mastered.

TIGNTFISTED

Take John E. Mitchell. Cultivating frugality to a high art, Cooper Tire & Rubber Co.'s IS director consistently manages to keep his department's budget below 1% of sales. Cooper's corporate culture wouldn't have it any other way.

"Cooper is notorious for being tightfisted," says Edward J. O'Brien, a securities analyst who covers the tire industry for brokerage firm Hilliard Lyons, Inc. in Louisville, Ky. "It has had a unit growth rate of only 1.7% compounded annually for the past 15 years," he explains. "That means competitive advantage comes from selling a product better, delivering it faster and making it cheaper."

Hence Mitchell's keen attention to finances.

But don't get the impression he's cheap. Mitchell's 112-person department oversees application development and operations that, despite a mere $12.6 million budget, add new capabilities to Cooper's overall business. The most recent example is a $5 million customer service, order-entry, pricing and inventory allocation system, the first large client/server system for the tire industry's low-cost leader.

"This project will improve our service by taking an order from our customers like Lands' End can do," Mitchell says. "The system isn't saving money. It's making money."

Impressive, yes. But even more impressive is this: Eight months into the 11-month development project, the Findlay, Ohio-based company remains on time and on budget.

The project illustrates just how Mitchell's team manages to pull productivity gains out of a thin wallet. The ingredients include extraordinary attention to detail, strong oversight and close ties with Cooper's internal customers. Like every project undertaken at Cooper, the customer service system has been managed with quarterly reviews that track project milestones, compare hours planned against hours spent and determine goals for the next quarter.

Smart and Cheap

IS SPENDING AS A PERCENT OF REVENUE FOR THE MOST RECENT FISCAL YEAR

Caraustar Industries, Inc.	0.7%
Champion Enterprises, Inc.	0.1%
Cooper Tire & Rubber Co.	0.9%
Premier 100 (Average)	2.6%

Source: *Computerworld* and company information

But the question remains: How does Mitchell squeeze the greatest corporate benefit out of his IS budget? "One way is to only work on the most important and best-return projects," he says.

Every capital expense at Cooper over $10,000 goes through a rigorous approval process, which includes a written justification, its expected monetary return and a thumbs-up or thumbs-down from a review board comprising 20 of the company's senior executives.

"We look at a dollar investment and the present value of

✎ **Garner** is a freelance writer based in San Carlos, Calif

LOW BUDGET

the cash flow that would result from it," explains Phil Weaver, vice president and Tire Division controller, who also sits on Cooper's capital appropriations committee. "Our philosophy is not to be on the bleeding edge of technology but to implement those projects that we think suit our needs on a cost-benefit basis," he says.

TEAM SPIRIT

That philosophy also guides the IS efforts at Champion Home Builders, a division of Champion Enterprises, Inc. But unlike Cooper, Champion competes in the roller-coaster industry of manufactured housing. "Our industry is so volatile that if a project will take more than a year to achieve return on investment, we probably won't tackle it," says Dave Waters, director of MIS at the Auburn Hills, Mich., company. "We don't want to get caught in a project where the needs will change in six to eight months."

Instead, Waters' staff spends most of its time on day-to-day operations, supporting 12 divisions across the country. That's hard enough for only five people with an $800,000 annual budget. Now add the fact that Champion has been acquiring companies and growing sales in its core business at nearly 50% a year and Waters' staff could easily be stretched to the breaking point.

That hasn't happened, though, for two critical reasons. First, the small IS staff works as closely as a team can possibly work. They are cross-trained in one another's disciplines, pitching in when a colleague needs help. Second, and possibly more important: The five people are intimately familiar with Champion's businesses.

For example, "The person who does all of our networking also happens to be extremely interested in the manufacturing process," Waters says. "He helped develop the purchasing and inventory systems across divisions."

Such a tight coupling has paid off. "They have all spent time visiting our manufacturing facilities, talking to people on the floor, to sales managers and to materials managers," says Mike Getz, Champion's manager of cost analysis. "There's a strong rapport between IS, the divisions and corporate. They are viewed as real business partners."

LONG-TERM PLANS

At Carlstar Industries, Inc., Donald Newsom combines the long-term planning seen at Cooper with the team spirit displayed at Champion. But unlike those at the other corporations, this IS director seeks out new technologies whenever they seem appropriate to the business of manufacturing paperboard and other paper products.

"I have one person working on a new billing order-entry system for our mill group and paper-stock group, someone else working on a similar system for our composite group and a third team that focuses on mill-floor applications, including bar coding and [electronic data interchange]," Newsom says.

Such development efforts naturally take a bite out of Newsom's $3.1 million budget, which can be a problem when Carlstar goes through one of its frequent acquisitions. In such cases, Newsom must find money to support new operations and users not previously built into the budget.

Like Mitchell at Cooper, Newsom must decide which projects deserve his staff's attention. "We used to put out a lot of fires, tried to make everyone happy," Newsom says. "Now we stay focused on the big projects."

How does he know which projects will derive the most benefit? It helps that he's been with Carlstar for 20 years. In that time, he has developed a special understanding of the personalities, operational issues and business imperatives at Carlstar. The average tenure in Newsom's department is 10 years.

It just goes to show: If you want to stay lean, you'd better know your company's business inside and out. Only then can IS managers make the right choices of where to spend limited funds. **100**



JOHN MITCHELL, Cooper's IS director, focuses on "fast-return projects" and makes sure his staff maintains close ties with internal customers.

Photograph by Daniel Levin

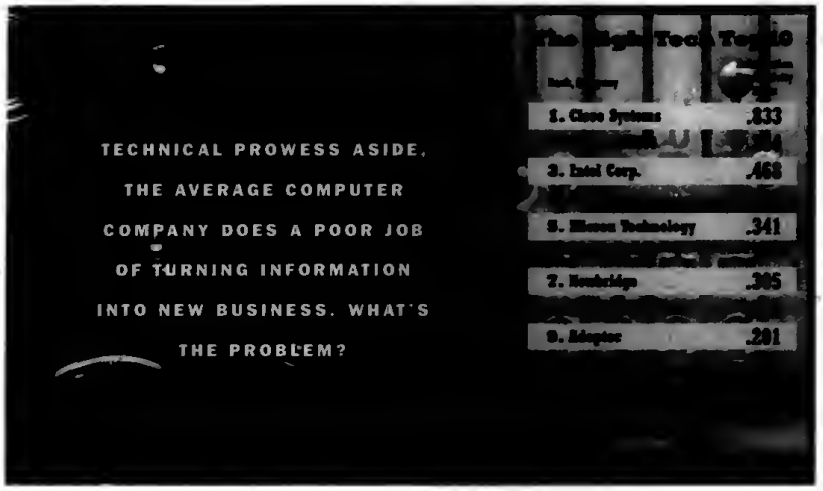


Illustration by John Baxter

COMPUTER INDUSTRY

The Trouble With Technology

BY H. GARRETT DEYOUNG

EARLIER THIS YEAR, Gateway 2000, Inc. hit a speed bump on its road to riches.

Long considered one of the brightest stars in the direct-sales PC constellation, the North Sioux City, S.D.-based company found itself short on components and swamped with calls from service-starved customers. The reason was its own success: 1994 net sales hit $2.7 billion, contributing to a one-year revenue increase of more than $1 billion.

"We were receiving as many as 10,000 customer calls a day," recalls Vice President and chief financial officer David McKittrick, "but could handle only about 4,000. We didn't keep up with our growth."

The outcome was a series of blistering user messages splayed across the Internet, loss of more than half of the company's sales-related input and, "probably some lost business," McKittrick says.

Gateway has since upgraded its phone system, added several hundred staffers to field routine calls and opened a 500-person customer-service center in Kansas City. Although customers can still "get caught in the lines, Gateway has made significant progress," says James D. Poyner Jr., an analyst at Oppenheimer & Co. in New York.

Gateway's story illusttates how companies are working to capture and utilize the reams of information that are helping to boost overall productivity — and generate new business. But such an effort appears rare in the computer hardware, software and office equipment sector.

Computerworld excludes this class of company from the *Premier 100* list because they develop and sell information systems. Even so, few computer-related firms would make it onto the list. The exceptions are listed in the chart at the top of this page, ranked according to the Information Productivity Index (IPI), the formula *Computerworld*

uses to rank the *Premier 100*.

Why do computer companies fare so poorly in information management? The industry's dependence on legacy systems is certainly one factor. Another factor is the rapid changes this industry faces. Of course, neither fully explains their lackluster performance.

One factor that seems to distinguish effective information management is dedication to customer service, says Paul Strassmann, the consultant who developed the IPI.

That may help explain the strength of Cisco Systems, Inc., the San Jose, Calif. supplier of internetworking products and services. Cisco's IPI of 0.83 puts it at the head of this year's list of computer suppliers and within the top 12% of the *Premier 100*.

SPEEDY TOOLS

Cisco relies on various IS tools to satisfy and respond to its customers, says Pamela George, a company spokesperson. Updated documentation on the company's products, for example, is routinely provided via CD-ROM rather than by printed media — a strategy that speeds up customer communications and cuts Cisco's documentation costs by 98%, George says.

Also, Cisco logs industry trade-show inquiries into the company's headquarters and routes them to the appropriate salesperson via pop-up messages.

"We receive about 80,000 log-ins per month on Cisco Infor-mation On-line," says George. "That tells us where the interest is."

Emphasizing customer focus, of course, rings hollow unless the IS function is in step with the company's business objectives. At Santa Clara, Calif.-based Intel Corp., for example, top IS managers get down in the trenches with the troops — in particular, with the sales force.

"We are not spectators [to the sales process] but participants," insists Louis Burns, Intel's director of architecture and standards in Folsom, Calif. In addition to providing the sales and marketing departments with networking, laptops and other tools, Burns sometimes accompanies salespeople on calls to see firsthand "how they think and work," he says.

One result of Burns' observations is Intel's "sales libraries," which are databases that give salespeople instant server-based access to customer-specific product and pricing information.

How does an IS executive at the average high-tech company improve information productivity? One suggestion is to make sure that IS is not an island. The most effective IS executives move comfortably between functions, gathering information that helps develop systems that business units need. Gateway's McKittrick, for instance, is a former IS manager who can straddle both worlds.

"[IS technicians] must learn the business. And businesspeople need to learn about IS," agrees Michael Welts, marketing director at Cabletron Systems, Inc. Net income for the Rochester, N.H.-based supplier of network components grew from $83.5 million in fiscal '93 to $162 million in fiscal '95.

"In the future, the MIS director will be held directly accountable for how well IT is utilized, not merely for observing a budget," he says. **100**

DeYoung is a freelance writer based in Scituate, Mass.

Big Blue's Information Re-engineering

IBM's PROMISING SECOND-QUARTER PROFIT of $1.3 billion, a 295% jump from the same period last year, suggests that the world's largest computer company may have finally left some of its performance problems behind.

Not everyone was impressed, however. "It remains an open question as to how IBM can do in a less favorable [economy]," notes one New York analyst.

Looking to the future, the important thing is how IBM plans to use its information resources to generate business and satisfy its customers, says Paul Strassmann, who developed the Information Productivity Index formula that *Computerworld* uses to rank the *Premier 100*.

"We have a lot of data, but not necessarily a lot of good information," admits Lorraine Fenton, vice president of quality and IT for IBM/U.S. in White Plains, N.Y. "We haven't fully leveraged [our information] resources."

Poor productivity

IBM'S VITAL STATISTICS

3-year IPI	-0.23
Revenue growth 1992-1994	0.4%
Net income 1994	$3M
Net income 1992	-$5M

Source: *Computerworld* and company reports

That's something of an understatement. In times past, Fenton says, IBM staffers often spent an inordinate amount of time looking for information such as customer preferences and complaints. "We didn't know who owned the [internal] information," she says.

IBM now is implementing an information re-engineering process designed to help gather and use the accumulated data, studies and reports needed to support its business units. The company is also establishing ownership of specialized information—that is, charging responsibility for maintaining relevant databases. Also in the works: a series of client/server tools designed to quickly get the information where it's needed.

Fenton claims that it's still too early to assess how any of this will actually change IBM's information flow, and in turn, its IPI. Specific database and networking tools are still being selected, she says, and the company has yet to design a set of metrics to gauge the ultimate effectiveness of the re-engineering initiative.

— *H. Garrett DeYoung*

Some Companies Add Servers.



Others Just Add Gigabytes.



Sun

The **Premier 100**

Premier 100 Ranking	Company	Industry	3-year Information Productivity Index, 1992-1994	Total Revenue* ($ in millions)	Net income* ($ in millions)	Total Number of Employees
3	Superior Industries International, Inc.	Transportation & Industrial Equip.	1.41	$456M	$56M	5,000
6	AES Corp.	Electric & Gas Services	1.26	$633M	$100M	600
3	Destec Energy, Inc.	Electric & Gas Services	1.01	$727M	$110M	703
6	UST, Inc.	Manufacturing	.96	$1,223M	$367M	2,000
5	Carnival Corp.	Recreational Products & Services	.94	$1,806M	$381M	15,000
6	Chase Brass & Copper Co.	Manufacturing	.93	$300M	$12M	270
3	United HealthCare Corp.	Health Services	.91	$3,768M	$1,665M	8,929
6	California Energy Co.	Electric & Gas Services	.91	$194M	$58M	275
6	Outback Steakhouse, Inc.	Food Services	.91	$451M	$39M	2,620
16	Alza Corp.	Pharmaceuticals	.90	$200M	$58M	1,078
11	Mercury Finance Co.	Financial Services	.84	$252M	$80M	650
12	Arnold Industries, Inc.	Transportation Services	.83	$308M	$38M	1,000
13	King World Productions, Inc.	Recreational Products & Services	.82	$480M	$86M	235
16	Adams Resources & Energy, Inc.	Manufacturing	.90	$634M	$3M	377
15	Western National Corp.	Financial Services	.79	$615M	$73M	201
16	International Game Technology	Manufacturing	.77	$674M	$146M	2,000
17	U.S. Healthcare, Inc.	Health Services	.77	$2,974M	$391M	3,900
16	John Nuveen Co.	Financial Services	.76	$230M	$58M	561
15	Medusa Corp.	Manufacturing	.67	$276M	$29M	1,238
20	BMC Industries, Inc.	Electronic & Electric Equipment	.88	$219M	$14M	2,000
21	Louisiana-Pacific Corp.	Paper & Paperboard	.63	$3,039M	$346M	11,500
22	Illinois Central Corp.	Transportation Services	.62	$993 M	$113M	3,104
23	Wabash National Corp.	Transportation & Industrial Equip.	.91	$561M	$23M	2,400
20	Green Tree Financial Corp.	Financial Services	.80	$407M	$161M	2,000
25	Wausau Paper Mills Co.	Paper & Paperboard	.91	$426M	$43M	1,700



Total Number of IS Employees (Range)	Total IS Budget 1995 (Range)	Percent Change in IS Budget '94 '95	Client/Server		Outsourcing		Percent of IS Budget Managed By		
			Percent of IS Budget	Percent Change '94 '95	Percent of IS Budget	Percent Change '94 '95	Corporate IS Managers	Business Unit IS Managers	Business/ Non-IS Managers
< 100	$1M - $4.9M	25%	NA	NA	0%	-100%	100%	0%	0%
< 100	< $1M	0%	0%	0%	0%	0%	20%	0%	80%
< 100	$1M - $4.9M	-45%	3%	-60%	3%	-40%	95%	3%	2%
< 100	$10M - $24.9M	14%	1%	10%	0%	0%	85%	5%	0%
100-249	$10M - $24.9M	5%	15%	5%	5%	75%	100%	0%	0%
< 100	< $1M	52%	0%	4%	96%	96%	100%	0%	0%
500-999	$100M - $249.9M	14%	25%	15%	2%	10%	75%	25%	0%
< 100	$1M - $4.9M	10%	0%	0%	0%	0%	90%	5%	5%
< 100	< $1M	25%	58%	30%	42%	0%	60%	10%	30%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	< $1M	0%	50%	0%	NA	NA	50%	50%	0%
< 100	< $1M	20%	20%	20%	0%	10%	20%	0%	10%
< 100	$1M - $4.9M	30%	50%	35%	0%	0%	100%	0%	0%
< 100	$5M - $9.9M	-9%	10%	10%	0%	0%	72%	28%	0%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	$5M - $9.9M	13%	20%	13%	0.1%	20%	23%	23%	34%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	< $1M	-30%	10%	-10%	10%	-50%	50%	25%	25%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	$10M - $24.9M	NA	NA	0%	25%	20%	100%	0%	0%
< 100	< $1M	20%	20%	50%	5%	0%	100%	NA	0%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	$1M - $4.9M	7%	10%	0%	2%	0%	50%	20%	20%

NA = Not available *Most recent fiscal year available

Illustration by Jon Flemming

The **Premier 100**

Premier 100 Ranking	Company	Industry	3-year Information Productivity Index 1992-1994	Total Revenue* ($ in millions)	Net Income* ($ in millions)	Total Number of Employees
26	Great Lakes Chemical Corp.	Chemical Manufacturing	.56	$2,065M	$278M	6,900
27	Mylan Laboratories, Inc.	Pharmaceuticals	.56	$251M	$73M	1,230
28	HealthCare Compare Corp	Diversified Services	.55	$186M	$50M	1,499
29	Morgan Keegan, Inc.	Financial Services	.55	$251M	$31M	1,028
30	Clark Equipment Co	Transportation & Industrial Equip.	.54	$946M	$161M	4,410
31	Topps Co.	Recreational Products & Services	.52	$200M	$20M	1,200
32	Galey & Lord, Inc.	Apparel, Textile & Furniture	.52	$451M	$17M	4,100
33	The Bear Sterns Cos.	Financial Services	.44	$3,441M	$380M	7,417
34	Caraustar Industries, Inc.	Paper & Paperboard	.44	$456M	$35M	3,040
35	International Dairy Queen, Inc.	Food Services	.44	$340M	$31M	447
36	Cooper Tire & Rubber Co	Transportation & Industrial Equip.	.43	$1,403M	$128M	7,800
37	Marvel Entertainment Group, Inc.	Printing & Publishing	.43	$514M	$61M	278
38	The Equitable of Iowa Cos.	Financial Services	.42	$651M	$98M	497
39	Southern Energy Homes, Inc.	Manufacturing	.43	$180M	$8M	1,096
40	Amgen, Inc.	Pharmaceuticals	.41	$1,549M	$319M	2,725
41	TBC Corp.	Wholesale/Retail	.40	$651M	$19M	240
42	WMS Industries, Inc.	Manufacturing	.40	$358M	$28M	2,000
43	Boston BancCorp	Financial Services	.40	$147M	$24M	200
44	Breed Technologies, Inc.	Transportation & Industrial Equip.	.40	$277M	$47M	5,000
45	Fossil, Inc.	Manufacturing	.39	$161M	$15M	300
46	First Data Corp.	Diversified Services	.36	$1,471M	$206M	13,300
47	Kinetic Concepts, Inc.	Diversified Services	.40	$200M	$20M	1,000
48	Abbott Laboratories	Pharmaceuticals	.34	$9,156M	$1,516M	49,484
48	International Flavors & Fragrances, Inc.	Manufacturing	.34	$1,319M	$220M	1,300
50	Merck & Co.	Pharmaceuticals	.34	$14,969M	$2,997M	47,100

Total Number of IS Employees (Range)	Total IS Budget 1995 (Range)	Percent Change In IS Budget '94-'95	Client/Server		Outsourcing		Percent of IS Budget Managed By		
			Percent of IS Budget	Percent Change '94-'95	Percent of IS Budget	Percent Change '94-'95	Corporate IS Managers	Business Unit IS Managers	Business/ Non-IS Managers
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,000 - 2,499	$10M - $24.9M	9%	40%	30%	0%	0%	100%	0%	0%
< 100	$1M - $4.9M	13%	15%	100%	60%	0%	100%	0%	0%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA	NA	NA	NA	*NA
< 100	$1M - $4.9M	3%	5%	60%	1%	0%	90%	5%	5%
500 - 999	$100M - $249.9M	7%	17%	34%	3%	2%	100%	0%	0%
< 100	$1M - $4.9M	12%	20%	50%	0%	0%	70%	0%	30%
< 100	$1M - $4.9M	27%	30%	0%	0%	0%	100%	0%	0%
100 - 249	$10M - $24.9M	7%	20%	100%	5%	25%	60%	35%	5%
< 100	NA	35%	33%	60%	53%	-50%	80%	80%	10%
< 100	$5M - 9.9M	10%	35%	20%	0%	0%	100%	0%	0%
< 100	> 1M	50%	23%	60%	0%	NA	80%	10%	10%
100 - 249	$50M - $99.9M	45%	3%	25%	5%	50%	50%	0%	50%
< 100	$1M - $4.9M	0%	0%	0%	1%	0%	100%	0%	0%
< 100	$1M - $4.9M	5%	3%	100%	2%	90%	100%	0%	0%
< 100	$1M - $4.9M	7%	17%	43%	84%	0%	100%	0%	0%
< 100	$1M - $4.9M	6%	10%	0%	10%	-10%	85%	10%	5%
< 100	$1M - $4.9M	20%	1%	100%	10%	100%	30%	30%	40%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	$1M - $4.9M	30%	40%	100%	0%	0%	30%	0%	30%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	$1M - $4.9M	5%	40%	12%	0%	NA	90%	0%	10%
500 - 999	$100M - $249.9M	14%	39%	14%	10%	9%	55%	42%	3%

NA = Not available *Most recent fiscal year available

The **Premier 100**

Premier 100 Ranking	Company	Industry	3-year Information Productivity Index 1992-1994	Total Revenue* ($ in millions)	Net Income* ($ in millions)	Total Number of Employees
51	A.G. Edwards, Inc.	Financial Services	.32	$1,278M	$154M	10,206
52	CBS, Inc.	Diversified Services	.32	$3,711M	$281M	6,000
53	CMI Corp.	Manufacturing	.32	$128M	$22M	750
54	Electroglas, Inc.	Manufacturing	.31	$112M	$22M	450
55	T. Rowe Price Associates, Inc.	Financial Services	.31	$382M	$61M	1,027
56	Arrow International, Inc.	Manufacturing	.26	$170M	$29M	1,500
57	American Home Products Corp.	Pharmaceuticals	.29	$8,966M	$1,528M	74,009
58	Valley National Bancorp	Financial Services	.29	$265M	$60M	1,166
59	Morgan Stanley Group, Inc.	Financial Services	.29	$9,176M	$786M	7,000
60	Health Management Associates, Inc.	Health Services	.26	$438M	$46M	4,000
61	The Coca Cola Co.	Food & Beverage	.28	$16,172M	$2,554M	31,300
62	Worthington Industries, Inc.	Manufacturing	.28	$1,288M	$84M	7,200
63	Ethyl Corp.	Chemical Manufacturing	.27	$1,174M	$97M	1,900
64	Norfolk Southern Corp.	Transportation Services	.27	$4,581M	$687M	30,135
65	Masland Industries	Transportation & Industrial Equip.	.27	$429M	$21M	3,000
66	Progressive Corp.	Financial Services	.27	$2,413M	$274M	4,000
67	Schering-Plough Corp.	Pharmaceuticals	.27	$4,657M	$922M	21,600
68	The Charles Schwab Corp.	Financial Services	.26	$1,004M	$136M	6,000
69	Nine West Group, Inc.	Wholesale/Retail	.26	$652M	$63M	4,500
70	Vicor Corp.	Electronic & Electric Equipment	.24	$113M	$22M	604
71	Gannett Co.	Printing & Publishing	.23	$3,824M	$465M	36,700
72	Charter One Financial, Inc.	Financial Services	.23	$423M	$67M	1,400
73	Vencor, Inc.	Health Services	.23	$396M	$31M	7,000
74	Chromcraft Revington, Inc.	Apparel, Textile & Furniture	.23	$134M	$11M	1,500
75	Express Scripts, Inc.	Health Services	.23	$384M	$12M	1,027

Total Number of IS Employees (Range)	Total IS Budget 1995 (Range)	Percent Change in IS Budget '94-'95	Client/Server		Outsourcing		Percent of IS Budget Managed By		
			Percent of IS Budget	Percent Change '94-'95	Percent of IS Budget	Percent Change '94-'95	Corporate IS Managers	Business Unit IS Managers	Business/ Non-IS Managers
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
100 - 249	NA	-2.3%	10%	100%	0%	NA	100%	NA	0%
< 100	$1M - $4.9M	26%	25%	75%	0%	0%	100%	0%	0%
< 100	< $1M	15%	0%	20%	7%	30%	80%	20%	NA
100 - 249	$25M - $49.9M	29%	33%	34%	0%	24%	73%	10%	13%
< 100	$1M - $4.9M	0%	0%	0%	0%	0%	25%	0%	50%
1,000 - 2,499	$100M - $249.9M	7.5%	7%	10%	0%	0%	10%	10%	10%
< 100	NA	15%	NA	0%	NA	NA	80%	20%	0%
5000+	> $500M	15%	25%	25%	0%	10%	90%	0%	50%
< 100	$1M - $4.9M	0%	30%	10%	NA	NA	80%	20%	0%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NA	NA	NA	0%	NA	0%	NA	0%	0%	NA
< 100	$5M - $9.9M	0%	90%	1000%	NA	1000%	100%	0%	0%
250 - 499	$50M - $99.9M	10%	5%	50%	5%	10%	30%	60%	10%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
500 - 999	$50M - $99.9M	25%	20%	25%	0%	0%	80%	25%	0%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
500 - 999	$100M - $249.9M	20%	20%	20%	NA	NA	100%	0%	0%
< 100	$5M - $9.9M	15%	10%	50%	NA	NA	100%	0%	0%
< 100	$1M - $4.9M	25%	20%	80%	0%	0%	100%	0%	0%
500 - 999	$50M - $99.9M	0%	0%	90%	2%	-7%	25%	10%	25%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	$25M - $49.9M	25%	10%	25%	25%	25%	75%	NA	25%
< 100	$1M - $4.9M	-10%	20%	0%	20%	-20%	100%	0%	0%
< 100	$10M - $24.9M	30%	40%	40%	25%	25%	25%	25%	0%

NA = Not available *Most recent fiscal year available

The **Premier 100**

Premier 100 Ranking	Company	Industry	2-year Information Productivity Index 1992-1994	Total Revenue* ($ in millions)	Net Income* ($ in millions)	Total Number of Employees
76	Rubbermaid, Inc.	Manufacturing	.22	$2,169M	$228M	13,000
77	Elliott Brothers, Inc.	Wholesale/Retail	.22	$100M	$6M	200
78	Bristol-Myers Squibb Co.	Pharmaceuticals	.22	$11,984M	$1,842M	47,700
79	Wm. Wrigley Jr. Co.	Food & Beverage	.21	$1,806M	$236M	6,700
80	St. John Knits, Inc.	Apparel, Textile & Furniture	.21	$127M	$14M	2,500
81	Equifax, Inc.	Diversified Services	.20	$1,421M	$128M	12,000
82	Martin Marietta Materials, Inc.	Manufacturing	.20	$501M	$58M	3,000
83	Cognos, Inc.	Food & Beverage	.18	$312M	$8M	3,200
84	Stewart & Stevenson Services, Inc.	Transportation & Industrial Equip.	.18	$1,138M	$67M	4,151
96	Champion Enterprises, Inc.	General Building Contractors	.18	$618M	$27M	3,035
96	Toll Brothers, Inc.	General Building Contractors	.13	$501M	$36M	1,000
96	Sunbeam-Oster Co.	Manufacturing	.18	$184M	$107M	1,400
96	Rollins Truck Leasing Corp.	Transportation Services	.17	$450M	$39M	2,550
96	McDonald's Corp.	Food Services	.17	$8,320M	$1,224M	86,174
90	Arthur J. Gallagher & Co.	Financial Services	.16	$356M	$30M	3,308
91	Solectron Corp.	Electronic & Electric Equipment	.15	$1,408M	$69M	3,000
92	Royal Caribbean Cruises Ltd.	Recreational Products & Services	.15	$1,171M	$136M	6,800
93	Supreme Industries, Inc.	Transportation & Industrial Equip.	.15	$136M	$9M	1,300
94	Anheuser-Busch Cos.	Food & Beverage	.13	$12,853M	$1,032M	43,345
96	ARCO Chemical Co.	Chemical Manufacturing	.14	$3,357M	$200M	3,000
96	Applebee's International, Inc.	Food Services	.13	$200M	$16M	8,700
93	Eli Lilly & Co.	Pharmaceuticals	.12	$6,711M	$1,208M	28,000
96	Swift Transportation Co.	Transportation Services	.11	$365M	$22M	2,100
96	Andover Corp.	Wholesale/Retail	.11	$40M	$2M	1,100
100	Campbell Soup Co.	Food & Beverage	.11	$6,000M	$630M	30,000

Total Number of IS Employees (Range)	Total IS Budget 1995 (Range)	Percent Change in IS Budget '94-'95	Client/Server		Outsourcing		Percent of IS Budget Managed By		
			Percent of IS Budget	Percent Change '94-'95	Percent of IS Budget	Percent Change '94-'95	Corporate IS Managers	Business Unit IS Managers	Business/ Non-IS Managers
100 - 249	NA	14%	1%	10%	10%	30%	50%	48%	2%
< 100	$1M - $4.9M	15%	20%	25%	0%	0%	90%	0%	10%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	$10M - $24.9M	9%	0%	30%	1%	24%	78%	12%	30%
< 100	$1M - $4.9M	10%	12%	80%	15%	45%	90%	0%	10%
1,000 - 2,499	$100M - $249.9M	0%	0%	2%	42%	30%	0%	100%	0%
< 100	$1M - $4.9M	10%	6%	NA	NA	NA	100%	0%	0%
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
< 100	$1M - $4.9M	0%	5%	5%	5%	0%	0%	100%	0%
< 100	< $1M	5%	15%	-30%	NA	70%	100%	0%	0%
< 100	$1M - $4.9M	70%	0%	0%	0%	0%	100%	0%	0%
NA	NA	NA	NA	NA	NA	NA	0%	0%	0%
< 100	$1M - $4.9M	16%	16%	25%	0%	-1%	100%	0%	0%
250 - 499	$50M - $99.9M	12%	0%	80%	4%	0%	100%	0%	0%
100 - 249	$10M - $24.9M	9%	80%	10%	90%	10%	80%	80%	80%
< 100	$10M - $24.9M	30%	60%	80%	5%	80%	80%	80%	0%
< 100	$10M - $24.9M	NA	5%	25%	0%	0%	100%	0%	0%
< 100	< $1M	0%	0%	0%	2.5%	0%	92%	0%	0%
NA	NA	0%	0%	0%	0%	NA	0%	0%	0%
100 - 249	$10M - $24.9M	0%	80%	20%	0%	0%	100%	0%	0%
< 100	$1M - $4.9M	20%	90%	90%	0%	0%	100%	0%	0%
500 - 999	$200M - $499.9M	2.5%	3%	40%	0%	0%	80%	15%	5%
< 100	$1M - $4.9M	0%	10%	0%	90%	90%	100%	0%	0%
< 100	$1M - $4.9M	0%	20%	5%	10%	5%	100%	0%	0%
250 - 499	$100M - $249.9M	20%	40%	100%	40%	300%	70%	90%	5%

NA = Not available *Most recent fiscal year available

COMMENTARY

THE INFORMATION PRODUCTIVITY INDEX MEASURES HOW WELL A COMPANY MANAGES INFORMATION. BUT NO MATTER WHAT YOUR IPI, YOU CAN ALWAYS

Keep improving

BY PAUL A. STRASSMANN

INFORMATION PRODUCTIVITY — your company's ability to manage information — is not based on the sophistication of your information systems organization. It is not affected by the kind of technology you have or how pervasive that technology is in your firm.

It is indifferent to whether you use mainframes or not. It certainly has no relation to the size of your information technology budget.

High information productivity can be found in organizations that have a balanced approach to management. IT is treated as an important contributor to achieving this balance but not more than that. These organizations deal with each function, including marketing, production, research, IT and administration, as equally important ingredients.

In an organic view of the enterprise, you can't afford to have any part cause malfunctions in other parts of the organization. Everybody depends on everybody else doing their respective job to create value. Productivity is the consequence of cooperation, integration, learning, shared accumulation of knowledge and clarity of goals and objectives. Without these attributes, even the most powerful supercomputer would be a wasted resource.

One of the fundamental principles of cybernetics is that overall performance of any system depends on how all its parts interact, not on how those parts work in isolation. When the efficiency of parts taken individually improves, it does not follow that the performance of the system as whole will get better. Enhancing an isolated business function to realize lower costs, improved efficiency or some other narrow functional objective such as modernization, may degrade overall results.



To increase your firm's information productivity, you must first identify which elements of its complex cybernetic interactions are defective. Here are some practical suggestions for IS managers:

1. Participate in the corporate planning and budgeting processes. These events are the only occasions when all the value-added creation elements that make up the information productivity ratio are open to negotiation.

2. Identify the major causes of value-detraction. Information productivity gains are realized much faster by eliminating the negative influences first rather than by initially focusing on new ventures or deploying the latest technology.

3. Start analyzing these deficiencies as if they were pathologies. Corporations, like people, suffer from diseases. They have asset sickness, experience marketing myopia, encounter broken engineering, suffer from congested overhead, become exposed to competitor bites or show customer-neglect afflictions. Each disease calls for a different remedy.

4. Become a valued member of the executive team that is assigned to restoring good business health. IT should be seen as part of a comprehensive solution, not somebody's idea of injecting the most recently advertised miracle drug.

If nothing else, begin to think holistically. It's not technology; it's how you manage technology with it that will improve your company's information productivity.

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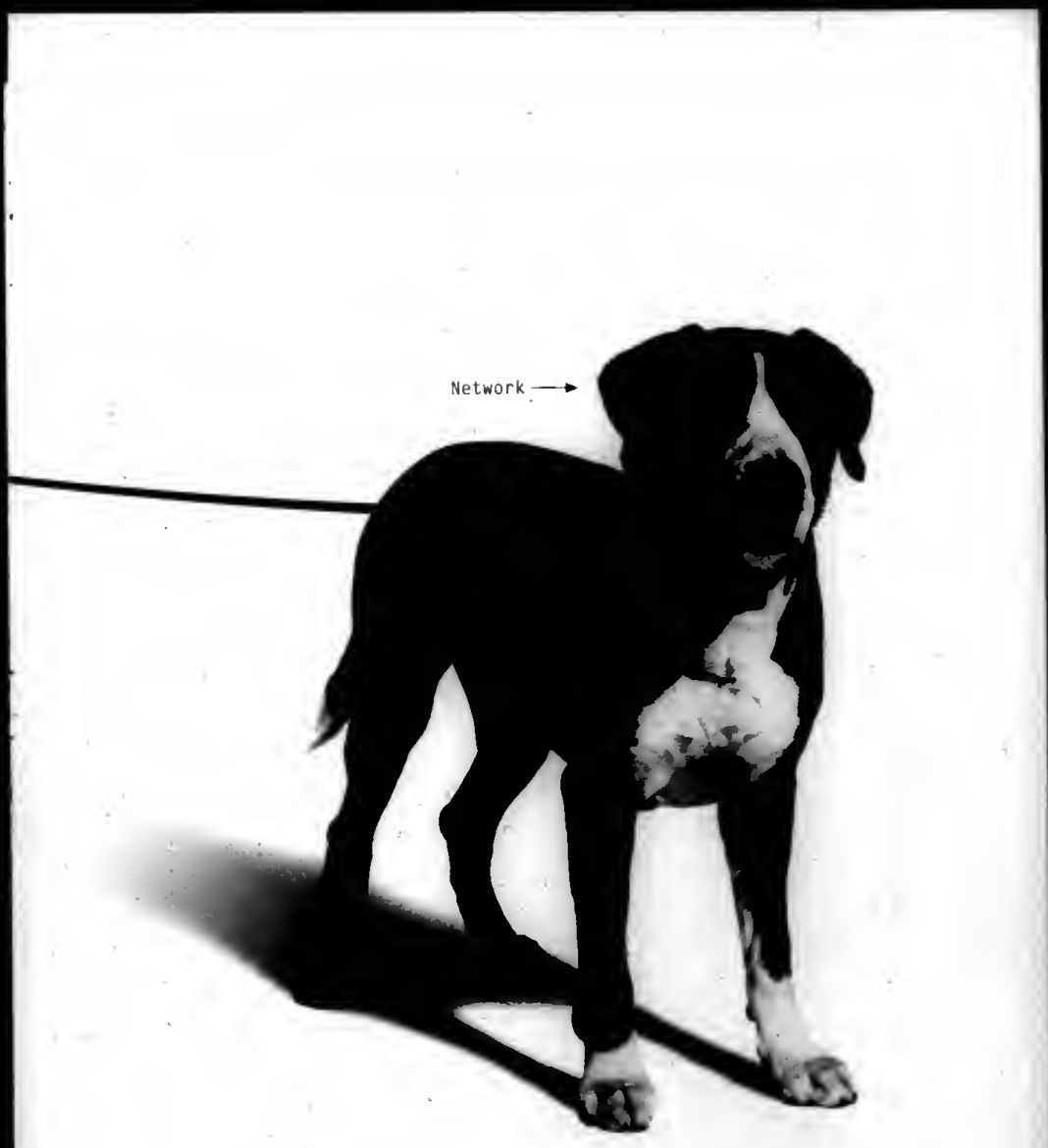
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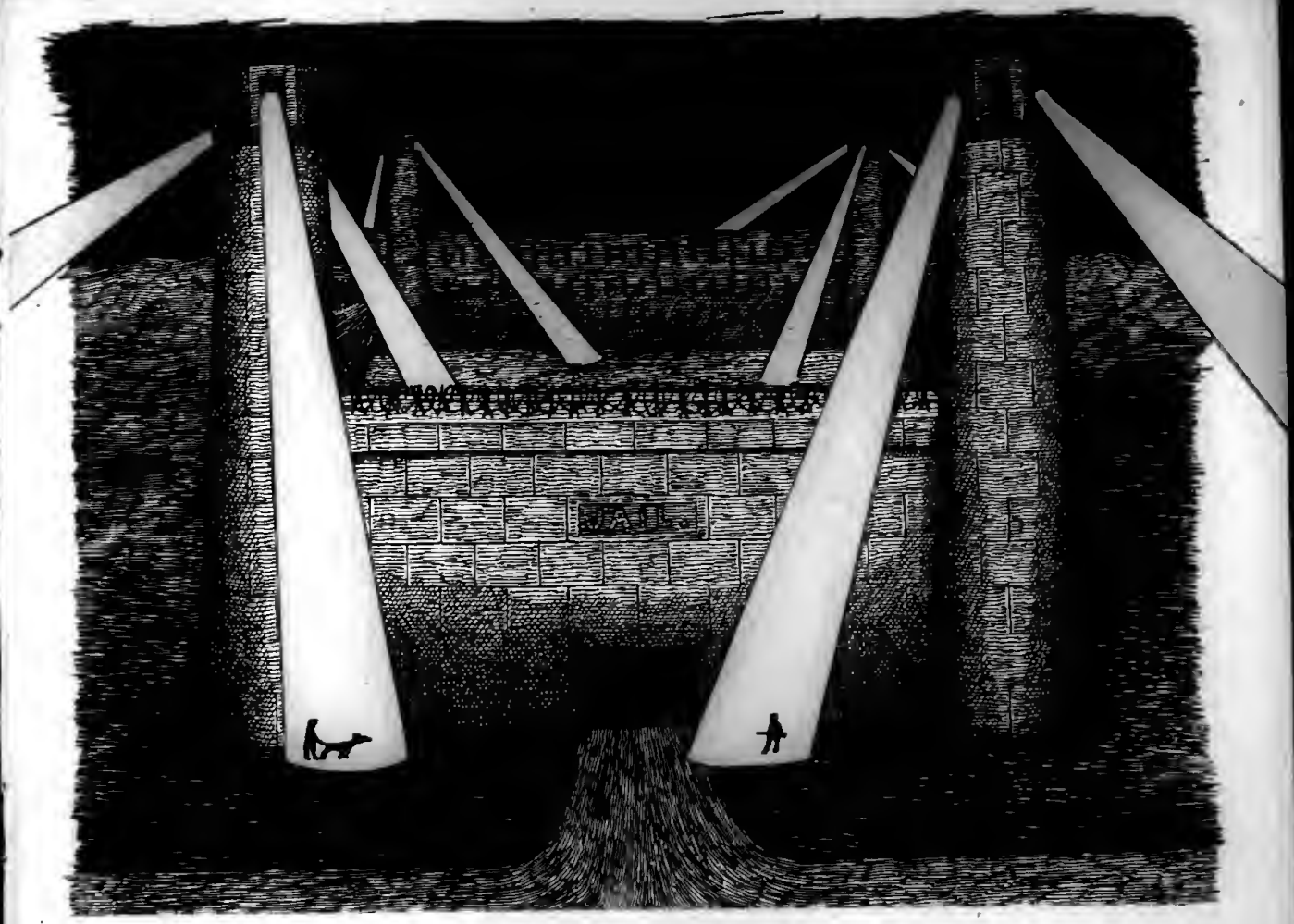


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